بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

Enhancing Maintainability in Hospitals Systems Using BIM and Business Intelligence

By

Mahmoud Mustafa Hanafy Mahmoud

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
INTERDISCIPLINARY - MASTER OF SCIENCE
in
Integrated Engineering Design in Construction Projects

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Title of Thesis
Enhancing Maintainability in Hospitals Systems Using BIM and Business Intelligence

Key Words:
Hospital systems; Maintainability Assessment; Building Information Modeling (BIM); Business Intelligence (BI).

Summary:
Maintainability consideration is becoming one of the most demanding aspects in designing of healthcare facilities in recent years. Operation and maintenance costs represent almost 80% of the overall hospital's life cycle cost. Maintenance cost needs to be planned and managed carefully from the early design stages. To archive this objective, a framework is proposed in this research to collect the required data from all business parties. These data to build the Maintainability Information Database (MID) which contains all the maintainability information including six regular service systems of hospital buildings for better maintenance planning. This database is attached to the BIM models of the hospital for better collaboration. Also, a maintainability assessment is introduced based on pre-selected eight maintainability indices through an extensive literature review. Moreover, the AHP model is used to determine the relative weights of the maintainability indices. Then, an integrated system is introduced which combines a BIM-based tool developed by C# programming language and Revit API with a Business Intelligence (BI) dashboard developed using Microsoft Power BI to enhance the process of the maintainability assessment. The outputs are linked with a BI dashboard to analyze and visualize the data to aid in decision-making regarding maintainability planning.

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: Mahmoud Mustafa Hanafy Date: / /

Signature:

Acknowledgments

All praises to Allah and His blessing for the completion of this thesis. I am thankful for all the opportunities, trials, and strength that have been showered on me to finish writing the thesis. I experienced so much during this process, not only from the academic aspect but also from the aspect of personality. My humblest gratitude to the Prophet Muhammad (Peace be upon him) whose way of life has been continuous guidance for me.

First and foremost, words cannot describe how I am extremely grateful to my supervisor, Prof. Mohamed Mahdy Marzouk for his invaluable advice, continuous support, patience, and understanding during my thesis steps. His immense knowledge and plentiful experience have encouraged me in all the time of my academic research and daily life. It has been a great pleasure and honor to have him as my supervisor.

I want to send my thanks to my friend Engineer Mohamed Mammduh for helping me in the registration process in the IEDM academic program, Also the BIM unit team members of Khatib & Alami - Nasr City office for providing encouragement and a warm spirit to finish this thesis. And special thanks to the geniuses; Architect Amira El-Saed and Engineer Hasan Tarek for their continuous assistance in the programming aspects to complete the development of the BIM-based tool.

I would sincerely like to thank my beloved parent for giving me literally everything they had selflessly during my entire life, Also, thanks to my beloved brothers and sister and my whole family members along with my beloved friends who were with me and support me through thick and thin.

Last but not least, Special Thanks to my beloved wife Aya for her continuous support and motivation, I am really blessed to have such a soul in my life, Due to my daughter birth, this thesis might have been finished 1 year earlier, but it won’t be as mature as it is now. So, I dedicated this work to my beloved daughter Eman, wishing her and all the above mention people a life full of happiness and prosperity. May Allah bless them all.

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