AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
COMPUTERS AND SYSTEMS ENGINEERING DEPARTMENT

GEOGRAPHICAL INFORMATION SYSTEM AND DECISION SUPPORT SYSTEM

BY

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A thesis
Submitted in Partial Fulfilment for The Requirement of
The Degree of Master of Science
in Electrical Engineering

Supervised By
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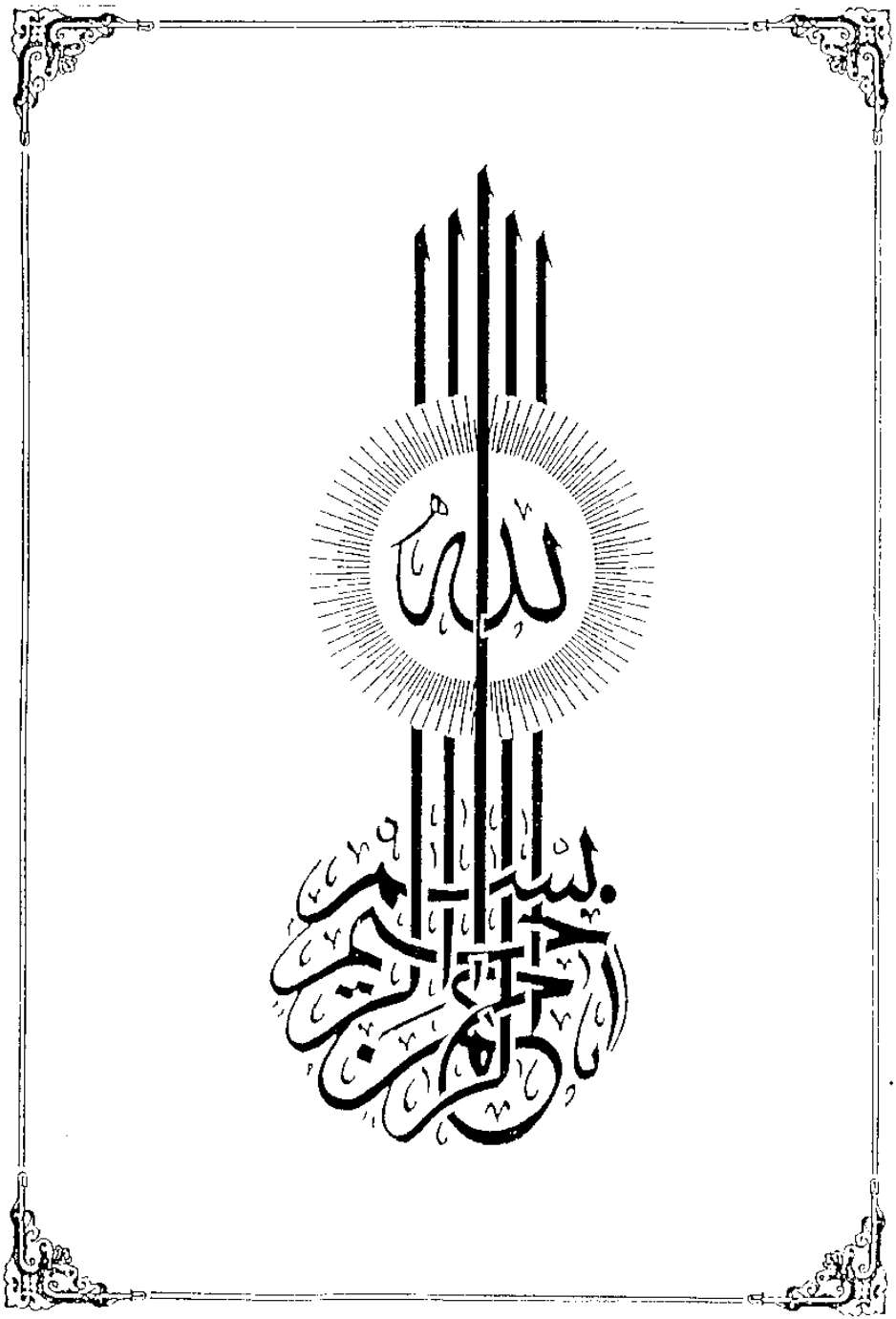
Dr. Hassan M. Shehata

Cairo 1996



بسم الله الرحمن الرحيم

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and

Decision Support System

For the degree of

Master of Science

by

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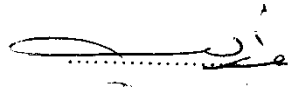

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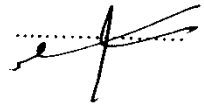

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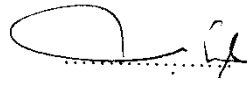

To

my son Amr

and

my daughter Sara

STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Master of Science in Electrical Engineering.

The work includedin this thesis was carried out by the author in the Department of Energy and Automotive, Ain Shams University.

No part of the thesis has been submitted for a degree qualification at any other university or institution.

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ABSTRACT

Mostafa Mohamed Ahmed. On Ggeographic Information System and Decision Support. For the Degree of Master of Science, Ain Shams University, Computers and Systems Engineering Department, Cairo 1995

This thesis utilizes one of the advanced information systems which are used in decision making. This technology is Geographical Information System (GIS). GIS is an essential information technology component for the future management and decision making for all activities. GIS is generally defined as an integrated computer system of hardware, software and procedures designed to support and provide a flexible and efficient method of capturing, manipulating, analyzing and displaying geographical information to support decision making. GIS provides retrieval and display of attributed data for an item or location for an area identified on a map display, and performing spatial and network analysis.

Although all current GIS-packages do not fully support analytical modeling we use some of the query function of GIS and the spatial and network analysis to help in decision making processes. We use some mathematical oriented tools with GIS to overcome the lack in analytical modeling . The decision is a conclusion or an end point of a process. The process begins whenever a manger observes a problem, determines that there is a conflict situation, or must make a choice among alternatives. A problem exists whenever there is a substantial difference between expectation and realization. Both the decision making and problem solving responsibilities of management have been discussed as almost equivalent terms. For our purposes, we will define the entire process as problem solving. Decision making ends with a recommendation that will solve the problem. Problem solving includes implementing this recommendation. The environment in which decision must be made and in which the manager must operate is changing rapidly. So advanced technology requires changes in management practices.

Complex technological environments, with more alternatives, greater uncertainty, higher cost for errors, become more risky to rely on intuitive decision making. The decision maker has a better chance of making a proper decision by using GIS and quantitative tools. In this research we take as an example some standard management scientific techniques to solve problems that fit into a standard classification. Management Scientific techniques use quantitative tool and scientific methodology to provide a rational way to make decision.