

**STUDIES IN MACRO LEVEL ANALYSIS AND DESIGN
OF
MANAGEMENT INFORMATION SYSTEMS**

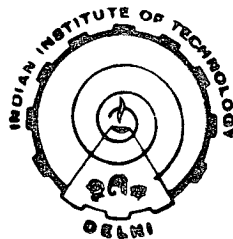
by

ABDUL BASIT KHAN

DEPARTMENT OF MECHANICAL ENGINEERING

*Thesis submitted in fulfilment
of the requirements for the degree of*

DOCTOR OF PHILOSOPHY



To the
INDIAN INSTITUTE OF TECHNOLOGY, DELHI

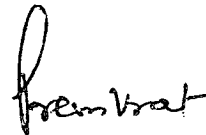
JULY 1988

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MY
PARENTS

CERTIFICATE

The thesis entitled "Studies in Macro Level Analysis and Design of Management Information Systems" submitted by Mr. Abdul Basit Khan to Indian Institute of Technology, Delhi, for the award of the degree of Doctor of Philosophy, is a record of bonafide research work carried out by him. He has worked under my guidance and supervision and has fulfilled the requirements for the submission of this thesis, which has attained the standard required for a Ph.D. degree of this institute. The results presented in this thesis have not been submitted elsewhere for the award of any degree or diploma.



PREM VRAT
Professor of Industrial Engineering
Department of Mechanical Engineering
Indian Institute of Technology
New Delhi-110016.

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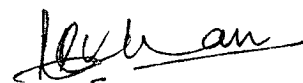
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(ABDUL BASIT KHAN)

A B S T R A C T

Studies concerning macro level analysis and design of MIS are reported in this thesis. In the first phase the literature in the MIS area has been reviewed extensively to determine the state of art and to identify the scope for further research. A pictorial scheme of representation has been developed to portray the growth of MIS literature in chronological order in a capsuled manner.

A questionnaire survey conducted to assess the attitudes of Indian managers, towards MIS and use of computers in organizations is reported. Two item pools were constructed to elicit the attitude towards the two targets mentioned above. Principal component analysis and Varimax Rotations methods were used to explicate the underlying dimensions measured by both the instruments. Factor scores for each respondent were calculated and group factor scores were plotted corresponding to three levels of management. Also, the decision-making profiles of Indian managers were obtained using the responses to a separate set of questions.

A contingency model of MIS design was constructed and is reported. The performance of the MIS was related to the situational factors using a theoretical model. The contingency model was operationalized by selecting contingency factors that impact the situational uncertainties associated with MIS design and implementation.

A methodology for the analysis and design of MIS at the macro level developed using digraph theory, matrix algebra, set theory and Boolean logic is reported. The methodology was aimed at determining the MIS architecture relevant to the strategic level planning. This architecture was represented by information-decision network that spans the entire organization. Set of computer programs, named INFODEC (for INFORMATION and DECision), was developed to perform the intricate mathematical operations required for modeling and was implemented on ICL-2960 computer system using FORTRAN programming language. Application of INFODEC modeling to a real-life situation is included.

A summary of the major findings and contributions made have been reported in this thesis. Towards the end an extensive bibliography on the subject area along with a set of computer listings developed and used in the study is enclosed.

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