

# **Effective Systems Design and Requirements Analysis**

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**Effective Systems Design  
and  
Requirements Analysis  
The ETHICS Approach**

**Enid Mumford**



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# Preface

This book aims to assist managers to introduce new information systems easily and effectively. It describes a systems design methodology called ETHICS - *Effective Technical and Human Implementation of Computer-based Systems* - which has been developed by the author to ensure that the non-technical aspects of systems design are handled efficiently and without stress.

ETHICS has three objectives related to the management of change. First, it seeks to legitimize a value position in which the future users of computer systems at all organizational levels play a major part in the design of these systems. The argument here is that people should be able to influence the design of their own work situations and that if this kind of intervention is encouraged then there are likely to be both job satisfaction and efficiency gains. The second objective is to enable groups concerned with the design of computer systems to set specific job satisfaction objectives in addition to the usual technical and operational objectives. The third objective is to ensure that any new system is surrounded by a compatible, well-functioning, organizational system.

The author argues that user involvement, clear job satisfaction objectives and a recognition of organizational factors will greatly assist the successful planning, design and implementation of computer-based information systems. ETHICS is a means for enabling everyone concerned with the introduction of new technology to consider human as well as technical factors when embarking on the design of a new system.

User participation is seen as an essential component in the successful design of most systems. All design is complex and takes time. Participation enables a shared learning process to take place in which systems designers and users can jointly contribute to the systems design process. Each of these groups has different interests and objectives and these can be brought out into the open and discussed as part of the participative process.

The ETHICS method is a set of logical, sequential steps which enables business and human needs to be considered at each stage of the design process. It assists the future users of the system to diagnose their needs and problems, set efficiency, effectiveness and job satisfaction objectives, examine alternative technical and organizational design strategies and select for implementation the ones that best fit the priority objectives. The book also provides guidance on how to identify and measure job satisfaction needs and on organizational design - the reorganization of work once a new technical system is introduced.

The front end of the ETHICS methodology, called QUICKethics - *Quality Information from Considered Knowledge* - is also being used with great success as a means for assisting managers and other staff to identify and document their information needs. The book describes how to carry out this requirements

analysis and provides a number of case studies to show how different groups carried out this exercise prior to choosing appropriate software for their information needs. These case studies are derived from hospitals and health care as all readers will have some familiarity with their organization and operation; however, the issues raised can be generalized to other organizations.

ETHICS is a problem solving methodology that has as its principal objective the successful integration of technology with the needs of users. It aims to base systems design on an accurate and careful diagnosis of efficiency problems, critical success factors and human needs, and to enable the future users of the system to carry out this diagnosis for themselves. It gives equal weight to technical and human needs. It ensures that the design task covers good organizational design as well as good technical design, and it aims to create systems which are effective, efficient, acceptable and rewarding to use.

The book is in three parts. Part 1 examines the problems of managing major change and the advantages of user involvement in systems design. The tools and steps in ETHICS are described and its results evaluated. The humanistic values which ETHICS contains are then compared with the ideas and values of past and present management thinkers. These include Mary Parker Follett, the American human relations school and two recent British gurus - Sir Geoffrey Vickers and Charles Handy. The section is concluded with a case study of how a software company used ETHICS to identify and solve its software problems.

Part 2 examines the front end of ETHICS, QUICKethics, as an aid for requirements analysis. In this section the problems of obtaining accurate specifications of information needs are discussed and the advantages of QUICKethics as a tool to assist analysis and documentation are described. A detailed example of how managers in different roles can use QUICKethics is provided, using a hospital as an example.

Part 3 provides case study examples of QUICKethics. These include the hospital where QUICKethics was first used and examples from other hospitals and health care units.

Many organizations have now used ETHICS. These include manufacturing firms, banks and hospitals. QUICKethics has been used in America by Digital Equipment Corporation and in the Netherlands by Dutch Telecom and KLM.

The author would like to thank the firms and other organizations which have used ETHICS. She would also like to thank CSG Consulting in the Netherlands, and its Managing Director Geert Jan Beekman, for its skill in helping European firms to implement and use the approach. CSG acts as a facilitator in firms that wish to use ETHICS and QUICKethics. Manchester University Health Services Management Unit and the doctors, administrators and nurses who contributed the case studies have also been of great assistance.

The author hopes that this book will be of value to managers introducing new computer-based systems and to students learning about systems design.