Information System Requirements: Determination and Analysis

by Donald J. Flynn

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Her main research interests, pursued for the last two decades, include information system development methodologies and tools, project management and quality assurance, CASE evaluation and technology diffusion. In 1978 she was one of the Romanian Academy prize winners for a paper entitled: "Language and Tools for Requirements Specification and Analysis". Handbooks and courseware addressed to both pupils and students are among her steady preoccupations.
She has been involved in joint research projects on system and software engineering, with partners coming from East European countries and from the former Soviet Union.
Her current research activities are paralleled with work on large-scale projects, one such project being the public administration IS in Romania.

The reader of the book is asked just from the beginning to mind a basic principle which the author intends to be the guiding thread of his writing,namely that: **"information system should serve a useful purpose in the organization and in the community and the use of technology for technology's sake is undesirable as it may have negative effects"**.

The preface-formulated principle could bear on the challenges,so far three of them are brought forward. of the future:

- a main criticism of the information systems of today would be that they miss, more often than not, the point made by their users and it seems that a "computer-centred" emphasis on technical issues in the development process takes the front in producing such an effect;
- from now on users are supposed to need information systems more for processing graphics and speech than for processing data which such systems usually did ,do and will do;
- information systems' users will direct their expectations to getting better organization, that means more effective and competitive information systems ,that will undoubtedly make the success or collapse of an enterprise.

A **"requirement centred view"** is a characteristic throughout the book,which tries to look coherently at all approaches,concepts,methods, tools and practices which the early stages of systems development process might face.

The four parts of the book are dedicated to: information systems basics, system modelling within organizational and managerial contexts, the development process, methods and tools in two alternatives: "hard approach" and "soft approach" of systems' requirements.

Part One - Information Systems Basics - reviews the general definition and benefits of an information system, using a fast- food take way of example. The benefits of information systems are contrasted with several problems, especially quality and productivity. The discussion on the information systems' types and contents is sustained by examples of applications.

Part Two - Understanding Information Systems in Organizations - develops - after the review of fundamental system concepts - a very interesting model, named OMNIS. The basic aim of OMNIS is to analyse a description of an organization so that relevant facts are separated out using model categories such as functional system and control

system, with two components: information system and management system. The information system is refined in three sub-systems: simulation system, message system and human-computer system. In this hierarchical modelling, terminal elements are: object, property, rule, event, process, transaction input, query and report. The OMNIS principles are non- redundancy, completeness, accuracy and clarity; a case- study illustrates the model. How management activities in an organization could match the information available in the information system is also discussed.

Part Three - Hard Approach to Information Systems -makes a very good synthesis of the most representative methods and techniques for requirements' determination and analysis.

The description and evaluation of methods and tools are preceded by an analysis of the system development process - under different approaches such as linear, iterative, user validation, evolutionary and prototyping model - and by a refinement of the requirements' determination practices and problems.

The requirements' determination and analysis in an information system are illustrated by a case-study of an inventory control system, which makes use of the concepts of the OMNIS model. Under Analysis I, the author intends an object-oriented approach of **entities** and **rules**; under Analysis II the traditional techniques of **process** analysis are described, and an object- oriented approach to integrating entities, rules and process is made.

After briefly going through the history of methods (pre- method era, structured methods, data-oriented methods, future methods and standardization trends), the author tackles four representative methods: Information Engineering (IE), structured system analysis and design, JSD and SSADM. The methods are viewed both theoretically by focussing on phases, products and techniques, and practically by showing how they model the same case- study (The University Library).

The final chapter of Part three presents the software tools available for method support: I-CASE architecture, characteristics of future tools and standardization trends in the field of CASE. The AUTO-MATE PLUS CASE is described in detail.

Part Four - Soft Approach to Information Systems - reconsiders the information systems problem, based on the definition of a successful system, which reads **"meet its targets of quality and productivity".** The quality target is attained when the system meets its requirements, while the productivity target is attained when that system is developed in due time and within the allocated budget . In this perspective, "hard approach" and "soft approach" are two alternatives .

The first assumption made by hard approach is that the problem to be solved is logically stated and has a computer solution. The second assumption is that the computer solution may be placed with the organization without taking into account broader social or psychological factors the system interacts with. The soft approach looks upon the hard approach as being too narrow; it allows for problem situations that may be investigated using a variety of techniques, and it also takes into account a wider organizational context (social and psychological issues and their impact on an information system in an organization). The soft approach is illustrated by three methods: SSM, participative system design, and the user factors life-cycle. Finally, a complementary approach is suggested,based on two organizational factors: requirements' uncertainty and process uncertainty."Soft Approach" also includes organization theory and information systems,strategic planning,social issues and information systems. The three topics are offered concepts,methodological approaches and practical recommendations. The book makes an excellent work from two perspectives: didactical and practical.Didactically speaking, the book is quite well-structured and could have a lot of success for the students qualifying in Information Systems discipline. Gradually introducing concepts and methods,offering concluding remarks, entering problems in open discussion and providing a relevant list of references as well as theoretical and methodological approaches will do for any recommendation of the book. From a practical point of view, the book makes an excellent grasp of the state-of-the-art of concepts,models,methods,tools and practical recommendations used in determining and analysing the information systems' requirements. Of a great importance are the "requirements' centred view" and "soft approach" which could play their part in changing the current mentality of systems analysts and designers and in preparing them for a new era of information systems.

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