Developing Information Systems

Concepts, Issues and Practice

INFORMATION SYSTEMS SERIES

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Developing Information Systems

Concepts, Issues and Practice

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In addition to his reading and his work on the estate, which required special attention in springtime, Levin had that winter begun writing a book on agriculture, the idea of which was that the temperament of the agricultural labourer was to be treated as a definite factor, like climate and soil, and therefore the conclusions of agronomic science should be deduced not from data supplied by soil and climate only, but from data of soil, climate, and the immutable character of the labourer.

Anna Karenina, Leo Tolstoy

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Preface

This book is based on our experience of teaching information systems development and management over a number of years to students of various backgrounds and career aspirations. The process of information systems development and management is presented here in its full richness and as an undertaking which requires the contributions of many different intellectual disciplines and skills. The book describes the backdrop against which many different tasks are performed by many different types of specialist: programmers, systems analysts, knowledge engineers, project managers, software engineers, information systems managers, and of course ‘users’.

Our objective is to introduce students to information systems as early as possible in their degree studies, and certainly not only after they have specialized in particular aspects of computer science or information technology. The subject of information systems is usually taught as an advanced course, often at a postgraduate level, after students have acquired a background in computing or other special topics of information technology. As a result, both teachers of such courses and books on information systems expend a great deal of effort in overcoming biases and misconceptions that have been formed from prior specialist technical training. Most teachers of information systems have a difficult task to explain that information systems development involves more than the design, coding and testing of computer programs, and that it is not equivalent to software engineering.

Information systems is also a topic taught to management and business studies students. It is, however, usually assumed that managers do not need to understand in great depth the technicalities of information systems development and evolution. Students on business courses are often provided with some level of knowledge of the various technologies applied in information systems today, and they are usually introduced to the options and the dilemmas faced in exploiting information as a business resource, and to a lesser degree managing information technology resources. However, books for management students do not usually treat the *process* of information systems development in any depth.

The result of these distinct focuses is that most professionals contributing to the development of information systems today, whether computer specialists or managers, have never studied the full process of information systems development and management. It is our contention that it is possible, indeed necessary, to teach information systems to students of computer technologies and those on business courses alike, and to do so in parallel with their other studies. Technical experts need to develop a clear sense of where their special skills fit into the overall effort that an organization makes when it sets out to change an

information system, while managers need to appreciate fully the effort and particular expertise that is involved in information systems development.

Our intention is that this book can be used as a textbook for both types of student on both undergraduate and postgraduate information systems courses. It is also suitable for business studies and management courses, complementing texts which elaborate on information technology topics. The presentation is such that it can be used alongside textbooks with detailed descriptions of the more technical aspects of information systems development and the methodologies that support it. Each chapter introduces material, structures a debate, and concludes with points for further discussion, possible activities and exercises for students. The concluding section of each chapter provides openings for follow-up study, not in general in the form of simple 'exercises' but of open questions that are suitable for research outside the classroom and group discussion. Each chapter has its own set of references together with suggestions for further reading.

The book proceeds from a simple description of fundamental information systems development tasks to a deeper presentation of current practices and their theoretical underpinning. It examines and clarifies key concepts relevant to information systems development and describes models used to view and organize the information systems development process. The book considers alternative approaches to information systems development, ranging from the engineering of a complex technical artefact to interventions leading to substantial organizational change. The book also considers the methodologies used to prescribe and promote professional practice and discusses the issues involved in managing information systems resources and in exploiting the potential of information technology.

The organization of the book is in three parts, together with an introductory chapter. Part 1 sets out a basic description of the tasks required to take an information systems project from its conception through its construction and to its actual operation. Chapter 2 considers the question of determining which system to develop, while chapter 3 considers how to set about launching a systems development project. Chapter 4 considers the essential tasks that are required to proceed to the delivery of an actual system, while chapter 5 considers the problem of installing and using a new information system. These four chapters are intended to provide a solid background of practical understanding against which the rest of the book is set.

Part 2 of the book goes on to examine the theoretical foundations that exist for the study of information systems and identifies and discusses themes which have influenced the study and the practice of information systems development. Chapter 6 discusses four key concepts that have vital importance for the study of information systems – information itself, the notion of systems, our understanding of technology, and the nature of human organizations. The chapter also explores some of the reference theories that researchers use to make sense of information systems phenomena. Chapter 7 then goes on to evaluate the

principal model for viewing and organizing the development process – the systems development life cycle – and discusses some alternative perspectives including ideas of prototyping and of evolutionary systems development. Chapter 8 discusses variations of approach to information systems development which stem from different perceptions of information systems either as technological innovation or as socio-organizational reform. Chapter 9 evaluates information systems development methodologies as an effort to guide how organizations approach systems development tasks and how methodologies define and promote professional practice.

Part 3 of the book moves on to consider the problems of managing and resourcing information systems activities. In chapter 10 the question of how to establish and manage information systems activities within an organization's structures is discussed. Chapter 11 then considers questions of how an organization can seek to chart its way forward, to exploit and innovate with technologies and to achieve success through information systems. The concluding chapter of the book argues for a broad perspective for the study of information systems: a perspective which shifts the focus from the normative to the analytical and from the needs of discrete organizations to the extensive socio-economic changes taking place in countries throughout the world.

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