Multimedia Databases in Perspective

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P.M.G. Apers, H.M. Blanken and
M.A.W. Houtsma (Eds)

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PREFACE

During the last decade, multimedia has emerged as a major research and development area. Pushed by advanced technology like huge-capacity storage devices, fast networks, and powerful work stations, new applications have arisen. Many definitions of multimedia systems exist, one of them being computer systems that support interactive use of at least one of the following information sources: graphics, image, voice, sound, and video. These systems have caused a boom in the world of entertainment, but also in other business areas great opportunities for novel products and services are available. The size of multimedia data is often huge, and the storage of huge amounts of data is a task normally allocated to database management systems. Although some modern database management systems offer facilities to support development of multimedia applications, many problems related to multimedia support are still not well understood.

This book reports on research efforts to solve some of these problems. An introductory knowledge of databases, and also of operating systems and network technology is assumed. The book is very suitable as material for courses at senior or graduate level, but also for upgrading the skills of computer scientists working on database management systems, multimedia systems or applications.

The book consists of four parts. Part I is called "Requirements for a Multimedia Database" and comprises chapters one to three. Chapter one presents an outline of the book.

Chapter two describes some typical multimedia applications together with their prototypical implementations. These descriptions are used in Chapter three to derive requirements for multimedia database systems and to compose a suitable client/server architecture.

The second part is called "Client Components". Chapter four treats the user interaction component in one of the most demanding settings, namely the virtual world environment. In Chapter five a component to search efficiently for information in a network of servers is characterised.

Part III ("Server Components") deals with the server. Chapters six and seven describe two languages that can function as (part of a) server interface, namely SQL3 and SGML/HyTime. We elaborate on the multimedia aspects of these languages.

Chapters eight and nine consider content-based retrieval and query processing. The content of multimedia data appears to be rather difficult to grasp.

Chapter ten addresses searching multimedia data and outlines an algorithm to efficiently search for data such as one-dimensional time series and two-dimensional images.

Part IV ("Environment") pertains to the environment of a multimedia system, but does not report on database specific topics. Chapters eleven and twelve characterise supporting technology, namely operating systems and networks respectively. Problems typical for multimedia applications are formu-

lated and solutions presented.

The final chapter handles multimedia applications from a business point of view. The chapter tries to answer the question: "Which factors in a business are critical for the succesful introduction of multimedia applications?"

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The contents of this book have been used in the Advanced Course "Multimedia databases in perspective", organised by the Database Group of the University of Twente in June, 1995. Several outstanding researchers contributed to the course and presented their research work; together they covered important aspects of a multimedia database system. This book has been composed by the authors of the various topics. The authors have, without exception, a high work load. We thank them for delivering their contribution in time.

The following people have all contributed in some way to the book *Multimedia Databases in Perspective*, either by commenting on draft versions of chapters, or helping to develop the ideas on which this book is based. Their help is greatly appreciated.

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Peter Apers
Henk Blanken
Maurice Houtsma

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