

DATA DICTIONARY

Implementation, Use, and Maintenance

ROM NARAYAN



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*To my wife,
Geetha*

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Preface

AUTHOR'S PURPOSE

The ideas presented in this book are the results of the author's experience in implementing data dictionary systems during a nine-year period. The book is intended for persons within the MIS departments of companies who are interested in understanding and implementing a data dictionary. The managements of such companies recognize that information is a resource that can be deployed as a competitive weapon in strategies to gain an increasing market share, growth, and profitability. This recognition is translated into action items that result in the creation of data administration and data base administration functions within the MIS department. Managers of smaller companies that are looking to get into information management will definitely benefit by understanding and perhaps selectively applying the concepts and practices suggested in this book, depending on the amount of resources that can be allocated to this effort.

Additionally, funding is authorized to purchase or develop a data dictionary system. In many cases, the implementation of a data dictionary becomes a peripheral effort at systems development instead of the central activity that precedes and then supports systems development and end-user computing. If the principles and exhortations in this book were followed and supported by top management, dictionary implementation and maintenance would indeed become a crucial part of the MIS effort, as it should be. The benefits from this effort would flow in all directions—to the benefit of the entire organization, not just MIS. This book attempts to define the concept and the context of the data dictionary, and takes the reader through an exposition of the benefits of having a fully populated data dictionary. It then describes how to prepare a proposal for implementing a dictionary, selling the benefits to the various constituencies, and maintaining the data in the dictionary. By reading this book, the reader would get an insight into what a dictionary is, how it is related to other things being done in an MIS department, how it ties into a dictionary as a major project within an organization.

Normally, MIS projects have sponsors in the user segments of the business and

are driven by sets of requirements or needs that can be quantified and are tangible; such may not be the case with a dictionary project. This is because there are several beneficiaries of the dictionary, and any one group may not possess the clout to sponsor and support the project in the long run. Even if a group takes on this role, as most data base administration groups tend to do, there is the danger that it may drive the dictionary implementation in such a way that it may not produce the desirable consequences for the entire organization. The way out of this situation is to have a sponsor in the organization at a high-enough level that that person can see the entire picture and drive the implementation through its gestation period, which can be anywhere from 12 months to 3 years. Once the Dictionary is self-sustaining, it can be subject to the project development and implementation process that prevails in the organization. This book will help the would-be sponsor to visualize the benefits and define a strategy that could be used to sell the project to other beneficiaries and provide direction to the implementation team. Examples of sponsors of the dictionary project include the director of MIS, manager of information resources, manager of data base administration, manager of end-user computing, and manager of systems development.

Success builds on success—and a dictionary project is no exception to this rule. This book proceeds on the assumption that in a project with a long gestation period, the ability to provide successes to the beneficiaries along the way is a key ingredient in ensuring the success of the total project. This book goes over the process of identifying the overall objectives of the project, the subobjectives as they apply to different constituent groups, and ways of identifying and reaching these goals.

Implementing the dictionary requires a combination of knowledge and skill that requires more than what is taught in college courses. Knowledge of the organization, its managers, and their objectives is of crucial importance in developing a strategy. Furthermore, a knowledge of dictionary concepts, installation and maintenance procedures, and benefits is important in communicating the pros and cons of dictionary use to users. This book attempts to give the reader a knowledge of dictionary use with which to communicate intelligently with different users, such as application system developers and operations personnel. The book does this through the liberal use of real-life examples, so that the reader is made aware of the various facets of dictionary usage and its consequences.

For the person who has the responsibility for developing the implementation plan and overseeing its implementation, the book offers the experiences of others who have gone through a similar process. The book is replete with examples from different systems and the procedures that have been used successfully in different sites. This information can be used and/or modified to suit the needs of the site and the strategies of the implementation manager.

For the individual or group with the responsibility for maintaining a dictionary and monitoring adherence to its policies, the book offers techniques and approaches that can be used to maintain the integrity of the data in the dictionary. In the area of initial population and maintenance of the dictionary, questions relating to the responsibility and accountability of individuals and groups often arise. These questions can be answered in only a general way because they are dependent on the specifics of the situation. Thus an environmental assessment is suggested before specific recommendations in the book can be put into action.

A comprehensive set of applications for a dictionary is described in this book. The purpose is to provide readers from different functional areas within MIS with a common base of concepts and information from which to draw. The book is organized such that different groups can benefit from reading sections of the book without having to read the entire book. Suggested reading sequences are provided for different classes of readers.

The methods proposed in this book are intended to be guidelines that can be used by a site administrator to develop an implementation strategy. There are many

pitfalls that can be avoided in implementing a dictionary, and if this book leads to a smoother implementation by eliminating a misstep here and there, the author's purpose will be served.

For those readers who need an overall understanding of a dictionary as well as the know-how to interact with it, this book will serve as a reference. Application system developers, data base administrators, and operations personnel who need to use a dictionary during the system development life cycle will find detailed step-by-step procedures to help them achieve their objectives.

It is worth repeating that a dictionary is a tool, not a solution in and of itself. Properly implemented and used, it can be of considerable help, but used improperly, it can negate the very goals for which it was created.

AUDIENCE

There are three audiences for this book: MIS professionals involved with implementing and maintaining a data dictionary, users (both readers and updaters) of a data dictionary, and college students who need to understand a data dictionary from a practical viewpoint.

Implementers—The MIS or DP manager, systems development manager, operations manager, data base administration manager, and systems planning manager of an installation that is planning to install a dictionary. After a quick rundown of dictionary concepts, this book addresses the specifics of hands-on implementation. The person responsible for installing and administering the dictionary would find the material on entity models extremely helpful in planning the implementation.

Users—Individuals in the MIS department and in the user departments who will interface with the dictionary will find in this book both basic concepts and implementation details for their specific function. These people can read the first few chapters to get an understanding of the dictionary, and then move onto the chapters that deal with the application of the dictionary to a specific area. The application examples are intended to give the reader a perspective on what to expect from the dictionary, and to generate support for the implementation.

Students—Although this book is targeted at the MIS practitioner, this book would prove useful as an additional text in the second semester of a data base management systems (DBMS) course within an MIS or computer science curriculum. The chapters dealing with entity modeling, data planning, and systems development life cycle (SDLC) reinforce concepts gained in DBMS courses. The practical nature of the book could be exploited by instructors who wish to assign students a practicum involving the development of a dictionary implementation at a company.

SCOPE AND LIMITATIONS

The scope of this book is the set of constructs and ideas needed to define the objectives and formulate the policies for implementing a data dictionary. The book is based on the experiences of the author in implementing dictionaries in a practical environment. It is believed that the ideas presented in this book can be implemented in any computer hardware/software environment (i.e., IBM, DEC, Honeywell, Data General, etc.).

The reader of this book is assumed to have some understanding of the way in which business organizations function and the ways in which people anticipate and react to change. This is a book about implementing a disciplined approach to information management, through the implementation of a dictionary system and its associated procedures. The reader is asked to keep in mind the following statement by Machiavelli: "There is nothing more difficult to take in hand, more perilous to con-

duct or more uncertain in its success, than to take the lead in the introduction of a new order of things" (*The Prince*, 1513).

SUGGESTED READING SEQUENCES

Chapters 1-3 serve to provide an understanding of Data Dictionaries and their role in information management. Chapter 4 outlines the organizational conditions that would support the implementation of a Dictionary. Chapters 5-12 focus on the details of Dictionary requirements analysis and implementation planning, population and maintenance strategies and procedures, selection of a Dictionary, training users, and monitoring performance of the Dictionary. Chapters 13-18 cover Dictionary applications from the user perspective. They cover Data Planning, Data Base Administration, System Development Life Cycle, Operations, Security, and End-User Computing.

Senior managers within the company seeking to move into information management should read Chapters 1-4. This will give them the overview plus the organizational requirements for a successful Dictionary project implementation. Information System managers and others responsible for information processing should read Chapters 1-4, 7, and 13-18. This would give them the perspectives that users of the Dictionary have. End users should read Chapters 1-3, 5, 6, and 18. This sequence would give them the overview, entity model concepts, naming conventions and standards, and use of the Dictionary for End-user Computing. Functional groups within the Information Systems organization should read Chapters 1-3, 5, 6, 9, 10, and the appropriate chapter pertaining to Data Planning, DBA, Systems Development, and Operations. It is important to grasp the use of the Dictionary over the course of the System Development Life Cycle, even though one is in a specialized functional area such as DBA or Operations. Finally, those directly associated with the implementation and on-going administration of the Dictionary should not only read the entire book, but also apply the concepts and use the examples to make their implementation a success.

ACKNOWLEDGMENTS

The material collected in this book reflects not only my experience with the implementation and use of dictionaries, but also the result of many, many discussions with people at Honeywell and Data General involved with various aspects of system design and development.

I would like to thank Steve Davidovich of the Ontario Civil Service for his encouragement in challenging "conventional wisdom" and looking beyond what is self-evident. A number of the implementation alternatives proposed in this book arose out of a quest for better methods of implementing a data dictionary.

I would also like to thank Hazel Dodds for assistance with initial editing of the manuscript, and the team at Prentice Hall, headed by Paul Becker, who have done an excellent job of producing the book.

Finally, I would like to thank my family for being patient with me during the many evenings and weekends that it took to complete the manuscript.

Additional Resources

The author conducts a training course called "Using Data Dictionary Effectively". The two main objectives of this course are:

1. To provide an overview of dictionary capabilities and usage, so that managers, systems and programming staff, data base administrators, and operations personnel can understand its potential and communicate on dictionary issues using a common framework.
2. To identify the key objectives of dictionary implementation, and show the steps that have to be taken to achieve those objectives.

It is taught several times a year, in major cities across the U.S. It is also available for on-site presentations.

A computer assisted instruction (CAI) package using the TRAINER 4000 CAI authoring system off Computer Systems Research Inc., of Avon, Connecticut, is available, and covers data dictionary fundamentals in an attractive interactive format. This course requires an IBM PC or compatible, and uses this book as the text.

This course is geared to functional users of the dictionary, who need to understand basic concepts, and specifically how they would interact with the dictionary during the system development life cycle. It will prove useful to those organizations that need to familiarize many people with dictionary concepts and practices in a short period of time.

To order a CAI diskette, send your name and address with a check, money-order, or company P.O., for \$49 per copy (\$55 for orders outside the U.S.) to the address shown below. Checks must be in U.S. funds and be drawn on a U.S. bank, or on a U.S. branch of a foreign bank. The CAI diskette is available in the 5 1/4 inch version or in the 3 1/2 inch version. You must specify which version you want shipped, and also whether you will operate it from the "A" drive (diskette) or the "C" drive (hard disk).

Also, the author publishes a newsletter called the Data Dictionary User Group Newsletter. It is published quarterly and contains articles and features of interest to professionals who are involved in applying data base and data dictionary concepts and tools in business, education, government, and non-profit organizations.

To obtain further information on the training course, CAI package, or newsletter, address correspondence to:

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Winchester, MA 01890
(617) 721-0249

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