



## Synopsis

An introduction to the Mumps Programming Language including programming examples. Mumps (Massachusetts General Hospital Utility Multi-programming System) is a general purpose programming language environment that provides ACID (Atomic, Consistent, Isolated, and Durable) database access by means of program level subscripted arrays and variables. The Mumps database allows schema-less, key-value access to disk resident data organized as trees that may also be viewed as sparse multi-dimensional arrays. Beginning in 1966, Mumps (also referred to as M), was developed at the Massachusetts General Hospital (MGH) on a PDP-7, the same architecture on which Unix was being implemented at approximately the same time. Because of its simplicity, low cost and ease of use, Mumps quickly became popular and established itself as the basis for many medical applications. COSTAR (COmputer-STored Ambulatory Record), for example, was a medical record, fiscal management and reporting system, developed in the mid-1970s for use in ambulatory care settings and it was widely used worldwide. Today, Mumps programs are employed extensively in financial and clinical applications. If you've been to a doctor, been seen at a hospital, or used an ATM machine, your data has probably been processed by a Mumps program. Mumps programs are the basis of the U.S. Veterans Administration's computerized medical record system VistA (Veterans Health Information Systems and Technology Architecture), the largest of its kind in the world. VistA is a collection of 80 different software subsystems that support the largest medical records system in the United States. It supports the medical records of over 8 million veterans, is used by 180,000 medical staff at 163 hospitals, more than 800 clinics, and 135 nursing homes. Mumps is used by many health care organizations including Allscripts, Epic, Coventry Healthcare, EMIS, Partners HealthCare (including Massachusetts General Hospital), MEDITECH, GE Healthcare (formerly IDX Systems and Centricity), Sunquest Information Systems, DASA, Quest Diagnostics, and Dynacare, among others. Some of the largest and most well known hospitals use Mumps based electronic health records systems. These include Kaiser Permanente, Cleveland Clinic, Johns Hopkins Medicine Hospitals, UCLA Health, Texas Health Resources, Massachusetts General Hospital, Mount Sinai Health System in New York City and the Duke University Health System. Among financial institutions, it is used by Ameritrade, the Bank of England, and Barclays Bank, as well as others. The main features: (1) Mumps supports a hierarchical and multi-dimensional database model. When viewed as a tree, database nodes can be addressed as path descriptions in a manner which is easy for a novice programmer to master in a relatively short time. Alternatively, the database can be viewed as sparse, n-dimensional matrices of effectively unlimited size; (2) Mumps includes an

extensive library of built-in string manipulation operators and functions; (3) Mumps runs on inexpensive, commodity servers and is easily scaled as demand grows; (4) Mumps can handle Big Data quantities of information that are beyond the capabilities of many RDBMS systems with very high levels of performance and throughput; (5) Mumps is easily managed without the need for database administrators; (6) Mumps databases are ACID (Atomicity, Consistency, Isolation, Durability) Compliant.

## Book Information

Paperback: 128 pages

Publisher: CreateSpace Independent Publishing Platform (June 19, 2008)

Language: English

ISBN-10: 1438243383

ISBN-13: 978-1438243382

Product Dimensions: 6 x 0.3 x 9 inches

Shipping Weight: 8.8 ounces (View shipping rates and policies)

Average Customer Review: 3.8 out of 5 stars 8 customer reviews

Best Sellers Rank: #861,449 in Books (See Top 100 in Books) #128 in Books > Medical Books > Medical Informatics #10623 in Books > Computers & Technology > Programming

## Customer Reviews

Kevin C. O'Kane is professor emeritus of computer science at the University of Northern Iowa. He is the author of an open source Mumps Compiler and Interpreter as well as more than 40 published papers in computer science with an emphasis on biomedical informatics.

The presentation of this book is for the most part pretty good, with a few exceptions. The examples chosen are occasionally mystifying but mostly chosen in a way that allowed me to feel I'd learned the basic language without sitting at a console trying examples. The underlying language it describes is remarkably weird and painfully quirky, so coming up with good examples to illustrate that is not always easy. There's a bias toward the M2 implementation, but the book tries to be clear about that, and occasionally notes where that matters--it's hard to be sure without getting a lot of implementations and comparing them how thorough they were on that particular point. Still, overall, I was happy with the book.

This book has a number of shortcomings, but for experienced programmers, it is adequate. There

are many typos/editing errors that detract from the readability of the text. Code examples are floated to avoid having page breaks within the example, but this has the unfortunate result of separating the example and its explanation, often by multiple pages. As someone with 25 years of programming experience in more than 20 languages, I was able to use this book to get a good introduction to mumps. However, it may not be sufficient for less experienced readers.

A number of the commands listed don't have examples or explanations of their arguments. This is an insufficient reference.

product is as described

Good layout as a reference, but not enough complete examples for newbies. Would help to have example programs available on the web. Still looking for such a book/url combination to follow though a full tutorial.

This book is a great concise introduction to the MUMPS language and database. As usual with programming books, it is to be read close to a keyboard, while practicing. I would recommend the fis-gtm (GT.M) compiler, that is now a Linux package.

Good Book

Good but needs more language limitations (e.g. max length of variable names, max length of global subscripts, etc...) but otherwise it was good reading. I wish the implementation had more standard features, especially in numeric global subscript sorting.

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