



A Publication of
the Special
Interest Group on
Information
Retrieval



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SPECIALISED HARDWARE FOR DATABASE MANAGEMENT AND INFORMATION

RETRIEVAL: A CLASSIFIED BIBLIOGRAPHY

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INTRODUCTION

From the early 70's a number of specialised hardware devices have been designed and some of them have been experimentally built. The common

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design aim of these devices is to incorporate in the hardware some of the functions most frequently used for the management of the information processing systems. These are implemented through software within conventional computer systems.

This bibliography groups the papers on specialised hardware through a novel functional classification. The grouping criterion of this classification is determined by the main functions the devices support and on their capacity to expand the capabilities of a conventional computer system for managing data and processing information. The classification is in three classes C1, C2 and C3.

C1 - 'Internal' Devices. Devices that have been designed to replace a part of a conventional computer system. The replacement would change the performance of the computer system essentially by a reduction of the execution time for some operations, rather than a radical change in the overall architecture. For this reason these devices are called internal devices: they work inside the conventional computer system architecture. Bubble memory and associative memory are significant examples of the devices. Some of them can be effectively used as components of the machines of class C2.

C2 - 'External' Devices. Devices that modify substantially the conventional architecture and for this reason are called external. In fact they are external to the conventional architecture, but they interact with it and together they create a new architecture. These

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are special purpose machines, because they are designed to perform operations that are not typical of the traditional architecture; namely they are specialised in data management operations like update, insert, delete and comparison of data records. Examples of these devices are the database machine and the database computer.

C3 - 'New' Generation Computer Systems. The typical devices to be inserted in this class are the new generation (sometimes called fifth generation) computer systems that are the final target of the national project launched in Japan to produce the machines necessary for the applications of the 90's. These computer systems would be of a complete different architecture from the von Neumann one. It is possible to insert in this class also machines that are being built elsewhere (some machines have been designed and experimentally built in Europe and in USA) to meet a substantially different architecture from the traditional one.

The view of the system and of the data can change for some groups of users with the introduction of devices of the first or second class; but the external users are unaware of the introduction of specialised hardware as they are usually unaware of the architecture of the computer system that they already use.

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This classification has been used as a directory to refer to the pertinent papers of the alphabetical list of references together with a CO class that is used to classify introductory, survey and evaluation Papers.

The list of references is in alphabetical order by name of the first author; if different references are given to an author alone and with others, the references to the author alone are given first.

The used abbreviations are reported at the end of the list. The abbreviations are not used in the reference title that is always reported as it is in the original text.

ACKNOWLEDGMENTS

The bibliographic research necessary for the preparation of this bibliography would not have been possible without the effective help of the librarians of the Main Library of the Thames Polytechnic to whom sincere thanks are due, and Mrs Coonerty of the Computing Services Centre.

CLASSIFICATION OF ALPHABETICAL ORDERED REFERENCES

C0 - Introductory, survey and evaluation references

(Bray et al, 1979)
(Champine, 1979)
(Champine et al, 1980)
(DEMAC1, 1979)
(DeWitt et al, 1981)
(DeWitt et al, 1982)
(Hammer, 1977)
(Harrison et al, 1981)
(Hsiao, 1979)
(Hsiao, 1980)
(Hsiao et al, 1979)
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(Lowenthal E.I., 1977)
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(PACTEL, 1979)
(Rowe et al, 1981)
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C1 - References on 'internal' devices

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- (Berra et al, 1979)
- (Bird et al, 1977)
- (Boral et al, 1982)
- (Burkowski, 1980)
- (Chang, 1978)
- (Chen et al, 1978)
- (Chung et al, 1980)
- (Fialkowski et al, 1980)
- (Haskin et al, 1983)
- (Hoagland, 1979)
- (Hu, 1978)
- (Kibler, 1980)
- (Lin et al, 1976)
- (Lipovski, 1977)
- (Lipovski, 1978)
- (McDonell, 1977)
- (Muraszkiewicz, 1981)
- (Pramanik, 1981)
- (Slotnick, 1970)
- (Todd, 1978)
- (Vineberg, 1977)
- (Wolf, 1980)
- (Zaky, 1977)

C2 - References on 'external' devices

- (Addis, 1982)
- (Armisen et al, 1981)
- (Babb, 1979)
- (Banerjee, 1980)
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- (Baum et al, 1976)
- (Berger Sabbatel et al, 1980)
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(Roberts, 1978)
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(Sadowski et al, 1978)
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C3 - References on new generation computer architecture

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- (Allen, 1982)
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LIST OF ABBREVIATIONS USED IN REFERENCES

Ann.	Annual
Archit.	Architecture
Assoc.	Association
Bull.	Bulletin
Chap.	Chapter
Co.	Company
Comm.	Communications
Conf.	Conference
DB(s)	Database(s)
DBMS(s)	DB Management System(s)
DBS	Database System
DDB(s)	Distributed Database(s)
D-DBMS(s)	Distributed DBMS(s)
Dept.	Department
Doc.	Document
Ed(s)	Editor(s), Edition
Engin.	Engineering
Inform.	Information
Int.	International
Jour.	Journal
Lab.	Laboratory
Nat.	National
p(p).	page(s)
Prin.	Principles
Proc.	Proceedings

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Pub.	Publication(s), Publisher or Publishing
RDBMS	Relational DBMS
Rep.	Report
Res.	Research
Ser.	Series
SIGMOD	Special Interest Group on Management of Data
Surv.	Survey(s)
Symp.	Symposium
Syst.	System(s)
Tech.	Technical, Technology
Trans.	Transactions
Univ.	University
VLDB	Very Large Data Bases

Short form of each month name.

All dates are given by month and year only.

The acronym of each state of U.S. that is used with zip code.