INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

IJRCM

A Monthly Double-Blind Peer Reviewed (Refereed/Juried) Open Access International e-Journal - Included in the International Serial Directories

Indexed & Listed at:

Ulrich's Periodicals Directory ©, ProQuest, U.S.A., EBSCO Publishing, U.S.A., Cabell's Directories of Publishing Opportunities, U.S.A.,

Open J-Gage, India [link of the same is duly available at Inflibnet of University Grants Commission (U.G.C.)],

Index Copernicus Publishers Panel, Poland with IC Value of 5.09 & number of libraries all around the world.

Circulated all over the world & Google has verified that scholars of more than 1866 Cities in 152 countries/territories are visiting our journal on regular basis.

Ground Floor, Building No. 1041-C-1, Devi Bhawan Bazar, JAGADHRI – 135 003, Yamunanagar, Haryana, INDIA

http://ijrcm.org.in/

CONTENTS

CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the area of Computer, Business, Finance, Marketing, Human Resource Management, General Management, Banking, Insurance, Corporate Governance and emerging paradigms in allied subjects like Accounting Education; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Monetary Policy; Portfolio & Security Analysis; Public Policy Economics; Real Estate; Regional Economics; Tax Accounting; Advertising & Promotion Management; Business Education; Management Information Systems (MIS); Business Law, Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labor Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; Public Administration; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism, Hospitality & Leisure; Transportation/Physical Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Digital Logic; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Multimedia; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic and Web Design. The above mentioned tracks are only indicative, and not exhaustive.

Anybody can submit the soft copy of his/her manuscript **anytime** in M.S. Word format after preparing the same as per our submission guidelines duly available on our website under the heading guidelines for submission, at the email address: **infoijrcm@gmail.com**.

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION**:

DATED: _____________

THE EDITOR
IJRCM

Subject: **SUBMISSION OF MANUSCRIPT IN THE AREA OF .**

(e.g. Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/Engineering/Mathematics/other, please specify)

DEAR SIR/MADAM

Please find my submission of manuscript entitled '____' for possible publication in your journals.

I hereby affirm that the contents of this manuscript are original. Furthermore, it has neither been published elsewhere in any language fully or partly, nor is it under review for publication elsewhere.

I affirm that all the author (s) have seen and agreed to the submitted version of the manuscript and their inclusion of name (s) as co-author (s).

Also, if my/our manuscript is accepted, I/We agree to comply with the formalities as given on the website of the journal & you are free to publish our contribution in any of your journals.

NAME OF CORRESPONDING AUTHOR:
Designation:
Affiliation with full address, contact numbers & Pin Code:
Residential address with Pin Code:
Mobile Number (s):
Landline Number (s):
E-mail Address:
Alternate E-mail Address:

NOTES:

a) The whole manuscript is required to be in ***ONE MS WORD FILE*** only (pdf. version is liable to be rejected without any consideration), which will start from the covering letter, inside the manuscript.
b) The sender is required to mention the following in the **SUBJECT COLUMN** of the mail:
New Manuscript for Review in the area of (**Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/ Engineering/Mathematics/other, please specify)**
c) There is no need to give any text in the body of mail, except the cases where the author wishes to give any specific message w.r.t. to the manuscript.
d) The total size of the file containing the manuscript is required to be below **500 KB**.
e) Abstract alone will not be considered for review, and the author is required to submit the complete manuscript in the first instance.
f) The journal gives acknowledgement w.r.t. the receipt of every email and in case of non-receipt of acknowledgment from the journal, w.r.t. the submission of manuscript, within two days of submission, the corresponding author is required to demand for the same by sending separate mail to the journal.

2. **MANUSCRIPT TITLE**: The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

3. **AUTHOR NAME (S) & AFFILIATIONS**: The author (s) **full name**, **designation**, **affiliation** (s), **address**, **mobile/landline numbers**, and **email/alternate email address** should be in italic & 11-point Calibri Font. It must be centered underneath the title.

4. **ABSTRACT**: Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain the background, aims, methods, results & conclusion in a single para. Abbreviations must be mentioned in full.

5. **KEYWORDS:** Abstract must be followed by a list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

6. **MANUSCRIPT**: Manuscript must be in ***BRITISH ENGLISH*** prepared on a standard A4 size ***PORTRAIT SETTING PAPER***. It must be prepared on a single space and single column with 1” margin set for top, bottom, left and right. It should be typed in 8 point Calibri Font with page numbers at the bottom and centre of every page. It should be free from grammatical, spelling and punctuation errors and must be thoroughly edited.

7. **HEADINGS**: All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

8. **SUB-HEADINGS**: All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.

9. **MAIN TEXT**: The main text should follow the following sequence:

INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

It should be in a 8 point Calibri Font, single spaced and justified. The manuscript should preferably not exceed ***5000 WORDS***.

10. **FIGURES & TABLES**: These should be simple, crystal clear, centered, separately numbered &self explained, and **titles must be above the table/figure**. **Sources of data should be mentioned below the table/figure**. It should be ensured that the tables/figures are referred to from the main text.

11. **EQUATIONS**:These should be consecutively numbered in parentheses, horizontally centered with equation number placed at the right.

12. **REFERENCES**: The list of all references should be alphabetically arranged. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow **Harvard Style of Referencing**. The author (s) are supposed to follow the references as per the following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parentheses.
- The location of endnotes within the text should be indicated by superscript numbers.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:

BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, KurukshetraUniversity, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

CONCURRENCY CONTROL IN DBMS WITH TIMESTAMPS

GEETIKA
ASST. PROFESSOR IN COMPUTER SCIENCE
GOVERNMENT COLLEGE
GURGAON

ABSTRACT

In this paper I have discussed the why Time stamping technique is used in concurrency control in DBMS and how it can be implemented. Here, as in locking technique problem of deadlock is found which is very important to resolve. So time stamping can resolve this issue to some extent. It can be implemented by two ways Formal and Informal. Timestamping refers to the use of an electronic timestamp to provide a temporal order among a set of events. Timestamping techniques are used in a variety of computing fields, from network management and computer security to concurrency control. Here, I will discuss in concurrency control. The timestamp ordering protocol ensures that any pair of conflicting read/write operations will be executed in their respective timestamp order. This is an alternative solution to using locks.

KEYWORDS

time stamping, multiversion concurrency control, formal timestamping, informal timestamping.

INTRODUCTION

Multiversion concurrency control (MVCC), in the database field of computer science, is a concurrency control method commonly used by database management systems to provide concurrent access to the database and in programming languages to implement transactional memory .Here, a database will implement updates not by deleting an old piece of data and overwriting it with a new one, but instead by marking the old data as obsolete and adding the newer *version*. Thus there are multiple versions stored, but only one is the latest. This allows the database to avoid overhead of filling in holes in memory or disk structures but requires generally the system to periodically sweep through and delete the old, obsolete data objects. MVCC also provides potential *point in time* consistent views. In fact read transactions under MVCC typically use a timestamp or transaction ID to determine what state of the DB to read, and read these *versions* of the data. This avoids managing locks for read transactions because writes can be isolated by virtue of the old versions being maintained, rather than through a process of locks. Writes affect future *version* but at the transaction ID that the read is working at, everything is guaranteed to be consistent because the writes are occurring at a later transaction ID. In other words, MVCC provides each user connected to the database with a *snapshot* of the database for that person to work with. Any changes made will not be seen by other users of the database until the transaction has been committed.

TIMESTAMP

One of the techniques used in MVCC is time stamping. In computing timestamping refers to the use of an electronic timestamp to provide a temporal order among a set of events. Time stamping techniques are used in a variety of computing fields, from network management and computer security to concurrency control. Here, I will discuss its role in concurrency control in DBMS. Time stamp is a monotonically increasing variable (integer) indicating the age of an operation or a transaction. A larger timestamp indicates a more recent transaction . Timestamp Ordering Algorithm: Basically three algorithms are used .

- Basic Timestamp Ordering
- Strict Timestamp Ordering
- Thomas's Write Rule

OPERATION

Following assumptions are made here.

- Every timestamp value is unique and accurately represents an instant in time.
- No two timestamps can be the same.
- A higher-valued timestamp occurs later in time than a lower-valued timestamp.

Timestamps can be generated in several ways.

1. One possibility is to use a counter that is incremented each time its value is assigned to a transaction. The transaction timestamps are numbered 1, 2, 3, . . . in this scheme. A computer counter has a finite maximum value, so the system must periodically reset the counter to zero when no transactions are executing for some short period of time.
2. Another way to implement timestamps is to use the current date/time value of the system clock and ensure that no two timestamp values are generated during the same tick of the clock.
3. A combination of the above two methods.

Time stamping technique is operated by two ways.

1. Formal
2. Informal

1. FORMALl

(Here TS is time stamp,A is action, T is transation,O is object,WTS is write timestamp and RTS is write time stamp.)

Each transaction (T_i) is an ordered list of actions (A_{ix}). Before the transaction performs its first action (A_{i1}), it is marked with the current timestamp, or any other strictly totally ordered sequence: $TS(T_i) = NOW()$. Every transaction is also given an initially empty set of transactions upon which it depends, $DEP(T_i) = []$, and an initially empty set of old objects which it updated, $OLD(T_i) = []$.

Each object (O_j) in the database is given two timestamp fields which are not used other than for concurrency control: $RTS(O_j)$ is the time at which the value of object was last used by a transaction, $WTS(O_j)$ is the time at which the value of the object was last updated by a transaction.

For all T_i:

For each action A_{ix}:

If A_{ix} wishes to use the value of O_j:

If $WTS(O_j) > TS(T_i)$ then **abort** (a more recent thread has overwritten the value),

Otherwise update the set of dependencies $DEP(T_i).\mathrm{add}(WTS(O_j))$ and set $RTS(O_j) = \max(RTS(O_j), TS(T_i))$;

If A_{ix} wishes to update the value of O_j:

If $RTS(O_j) > TS(T_i)$ then **abort** (a more recent thread is already relying on the old value),

If $WTS(O_j) > TS(T_i)$ then **skip** (the Thomas Write Rule),

Otherwise store the previous values, $OLD(T_i).\mathrm{add}(O_j, WTS(O_j))$, set $WTS(O_j) = TS(T_i)$, and update the value of O_j.

While there is a transaction in $DEP(T_i)$ that has not ended: **wait**

If there is a transaction in $DEP(T_i)$ that aborted then **abort**

Otherwise: **commit**.

To **abort**:

For each $(\mathrm{old}O_j, \mathrm{old}WTS(O_j))$ in $OLD(T_i)$

If $WTS(O_j)$ equals $TS(T_i)$ then restore $O_j = \mathrm{old}O_j$ and $WTS(O_j) = \mathrm{old}WTS(O_j)$

2. **INFORMAL**

Whenever a transaction starts, it is given a timestamp. This is so we can tell which order that the transactions are supposed to be applied in. So given two transactions that affect the same object, the transaction that has the earlier timestamp is meant to be applied before the other one. However, if the wrong transaction is actually presented first, it is aborted and must be restarted.

Every object in the database has a read timestamp, which is updated whenever the object's data is read, and a write timestamp, which is updated whenever the object's data is changed.

If a transaction wants to read an object,

- but the transaction started *before* the object's write timestamp it means that something changed the object's data after the transaction started. In this case, the transaction is canceled and must be restarted.
- and the transaction started *after* the object's write timestamp, it means that it is *safe* to read the object. In this case, if the transaction timestamp is after the object's read timestamp, the read timestamp is set to the transaction timestamp.

If a transaction wants to write to an object,

- but the transaction started *before* the object's read timestamp it means that something has had a look at the object, and we assume it took a copy of the object's data. So we can't write to the object as that would make any copied data invalid, so the transaction is aborted and must be restarted.
- and the transaction started *before* the object's write timestamp it means that something has changed the object since we started our transaction. In this case we use the Thomas Write Rule and simply skip our write operation and continue as normal; the transaction does not have to be aborted or restarted
- otherwise, the transaction writes to the object, and the object's write timestamp is set to the transaction's timestamp.

CONCLUSION

Multi-version concurrency control (MVCC) is a common way today to increase concurrency and performance by generating a new version of a database object each time the object is written, and allowing transactions' read operations of several last relevant versions (of each object), depending on scheduling method. A timestamp is a unique identifier created by the DBMS to identify a transaction. Typically, timestamp values are assigned in the order in which the transactions are submitted to the system, so a timestamp can be thought of as the *transaction start time.* We will refer to the timestamp of transaction T as TS(T). Concurrency control techniques based on timestamp ordering do not use locks; hence, *deadlocks cannot occur.*

REFERENCES

1. http://community.ingres.com/wiki/MVCC
2. http://discovery.csc.ncsu.edu/Courses/csc742-S02/T14_CControl_TO_6.pdf
3. http://en.wikipedia.org/wiki/Multiversion_concurrency_control
4. http://en.wikipedia.org/wiki/Serializability#Enforcing_conflict_serializability
5. http://www.cs.ucy.ac.cy/~dzeina/courses/epl446/lectures/16.pdf
6. http://www.scribd.com/doc/8782868/DBMSch16
7. https://www.classle.net/book/timestamp-based-protocol
8. Multi-Version Concurrency Control in the H2 Database Engine
9. Philip A. Bernstein, Vassos Hadzilacos, Nathan Goodman (1987): Concurrency Control and Recovery in Database Systems (free PDF download), Addison Wesley Publishing Company, ISBN 0-201-10715-5
10. White paper by Roman Rokytsky Firebird and Multi Version Concurrency Control
11. www.slideshare.net/votis/timestamp-based-protocol

REQUEST FOR FEEDBACK

Dear Readers

At the very outset, International Journal of Research in Computer Application and Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you to supply your critical comments and suggestions about the material published in this issue as well as on the journal as a whole, on our E-mail **infoijrcm@gmail.com** for further improvements in the interest of research.

If you have any queries please feel free to contact us on our E-mail **infoijrcm@gmail.com**.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-

Co-ordinator

ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

Our Other Journals