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# SHODH DARPAN

A Quarterly International Research Journal

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## From the Patron's pen.....

Happy to know that Shodh Darpan is publishing Sept- 2015, Vol. -1 No-2. I appreciate the goodwill of the contributors in their pursuit for keeping research mind blooming. Heartfelt congratulations to Dr. Ashim Ranjan Sarkar, Editor-in-Chief and team members, especially to Dr. Anita Nair and Mrs. Siji Jestus John. May this be an inspiration and an opportunity for many to pursue their research activities! With best wishes,

**-Fr. Dr Paul Joseph Thymootil**

# SHODH DARPAN

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# CONTENT

# Algorithm for Incremental Mining of Sequential Patterns

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**Abstract**

*In this paper an efficient, Progressive algorithm to handle the maintenance problem of RFM-sequential patterns is proposed . An updated RFM-tree is built using the RFM- sequential patterns obtained from the static database to control the dynamic nature of data updating process and deletion process into the sequential pattern mining problem.*

## 1.1. Introduction

The proposed algorithm for incremental mining of sequential patterns, Progressive RFM (**R**estrictions, **F**requency, **M**onetary)-Miner is developed to extract useful patterns from progressive databases. This work is preceded by development of two algorithms, RFMLPrefixSpan and RFM-PrefixSpan. These are Restrictions-based sequential pattern mining algorithms that work well with static databases. With dynamic changes these algorithms need to re-mine entire database to get new updated constraint based patterns. RFM-PrefixSpan is a special case of RFML-PrefixSpan algorithm without length constraint. As discussed, in Chapter 3, selection of restrictions, frequency and monetary constraints is specific to customer value analysis for RFM. However, RFML PrefixSpan studies customer purchasing behavior for any application. The selection of appropriate constraints makes the difference in their application. This research work started with study of customer purchasing behavior to present RFML-PrefixSpan algorithm. Later, we continued our study for RFM domain, and hence use RFM-PrefixSpan algorithm as a vital step for our proposed incremental mining algorithm, Progressive RFM-Miner**.** However, all these three algorithms make use of proposed REPRE framework to incorporate constraints**.**

## 1.2. Progressive RFM-Miner: An algorithm for incremental mining of sequential patterns

As databases develop, the problem of maintaining sequential patterns over an extensively long period of time turn into essential, since a large number of new records may be added to a database. To reflect the current state of the database where previous sequential patterns become insignificant due to the addition of fresh sequential patterns, it is must to have competent approaches and algorithms that can maintain and manage the updated knowledge. Incremental mining algorithms efficiently calculate the new set of frequent item sets by fundamentally reusing beforehand mined information and attempting to merge

this information with the fresh data. In fact, several application domains incrementally update the contents of databases. For instance, appending of newly bought items for existing customers for their later buying and/or inclusion of new shopping successions for new customers causes the shopping transaction database to grow on a daily basis (Wang *et al*., 2007). This helps to reduce the computational and I/O expenses (Chen and Cook, 2007).

Here, an efficient algorithm to handle the maintenance problem of RFM-- PrefixSpan algorithm (Restriction, Frequent, Monetary-constraints based sequential patterns) is presented. In order to efficiently capture the dynamic nature of data addition and deletion into the mining problem, initially, RFM-tree is constructed using the RFM patterns obtained from static database. Then, the database gets updated from the distributed sources that have data which may be static, inserted, or deleted. Whenever the database is updated from the multiple sources, RFM tree is also updated by including the updated sequence. Then, the updated RFM-tree is used to mine the progressive RFMpatterns using the proposed tree pattern mining algorithm.

**1.3. Preliminaries**

Let $S = \langle (p_1, t_1, M_1), (p_2, t_2, M_2) \ldots (p_n, t_n, M_n) \rangle$ be a data sequence of database *D*, where $p_j$ is an item, $m_j$ is a purchasing money and $t_j$ signifies the time at which $p_j$ occurs, $1 \leq j \leq n$ and $t_{j-1} \leq t_j$ for $2 \leq j \leq n$. *P* denotes a set of items in the database *D*. $I = \{ i_1, i_2, \ldots\ldots, i_m \}$ be a set of literals, called items. An item set '*X*' is a set of items hence, $X \leq I$. A sequence $S = (s1, s2, \ldots\ldots, sn)$ is an ordered set of item sets. Consider two sequences $S1 = (a1, a2, \ldots\ldots, ak)$ and $S2 = (b1, b2, \ldots\ldots, bl)$. We say that *S1* contains *S2*, or equivalently, *S2* is a subsequence of *S1* if there exist integers $j_1, j_2, \ldots.j_l$ , such that $1 < j_1 < j_2 < \ldots.. < j_l < k$ and $b_1 \text{ Í} a_{j1}$, $b2 \text{ Í} a_{j2}$, ..., $bl \text{ Í} a_{jl}$, represented as *S2* ÍS*1*. A sequence 'S' is said to be constrained if a sequence 'S' contain a specified constraint, C.

For the incremental update problem, we consider that the constraint sequential pattern mining can be executed on database D to find the constraint sequences. But, the database D is updated by inserting or deleting set of sequences dB. Let us denote the updated database U such that U=DUdB. Here, the incremental update problem is to find all constraint frequent sequences in the database U for each next time intervals without scanning the whole database U.

The algorithms considers user-specified compact threshold '$T_C$ ', monetary threshold 'Tm ' , length threshold $l_s$ and a user defined minimum support threshold 'min_sup' to consider the compactness, monetary, length and frequency constraints in database 'D' .

**1.3.1. Terms Used in Algorithm**

i. ***RFM-tree***: For a Progressive Database D, we can construct a RFM-tree after mining the RFM patterns from it. Here, every node 'n' in the RFM-tree contains items and its relevant infor-

mation, represented as, n= [(p {$t_1$, $t_n$}), (M, F)+, where, 'p' is the item, $t_1$ is the starting time interval, tn is the ending time interval, M is monetary and F is frequency. Here, the depth of the RFM-tree, 'd' is equivalent to the larger length of the RFM-sequential patterns.

ii. ***Empty node***: A node in the RFM-tree is called as empty node only if (a) $t_1$ and tn is filled with zero, (b) 'p' should contain the item information and (c) M and F have the zero value. This node is necessary for building the RFM-tree after mining the sequences from the static database because the RFM-miner does not satisfy the downward closure property. So, some of the sequential patterns are frequent but, their subsets may not be frequent. These types of subsets are stored in the empty nodes, but their supersets are stored in the precious RFM-node that is frequent.

iii. ***Precious RFM-node:*** A node in the RFM-tree is called as precious RFM-node only if (a) $t_1$ and tn contains the information of time occurrence, (b) 'p' should contain the item and, (c) M and F have the valuable information about its monetary and frequency.

iv. ***Updated RFM tree:*** After inserting some nodes in RFM-tree on behalf of updated database, then it is called as, updated RFM-tree, in which some nodal information database D and a sequence $S_U$ = {($q_m$, $t_{n+1}$, $M_m$)} be an updated sequence, where $p_j$ is an item, mj is a purchasing money and tj signifies the time at which $p_j$ occurs, $1 \le j \le n$ and $t_{j-1} \le t_j$ for $2 \le j \le n$. 'P' denotes a set of items in the database D. A sequence $S_S$ = {($q_1$, $t_1$, $M_1$),($q_2$, $t_2$, $M_2$),...,($q_m$, $t_m$, $M_m$)} is said to be a progressive compact sequence only if,

(a) item set SS is a subsequence of S||$S_U$,

(b) SS should have item, qm, and

(c) the compactness constraint is satisfied, i.e. $t_m - t_1 \le T_C$.

viii. ***Progressive compact monetary sequence:*** Let S = {( $p_1$, $t_1$, $M_1$), ($p_2$, $t_2$, $M_2$), …, ($p_n$, $t_n$,$M_n$)} be a data sequence of database D and a sequence $S_U$ = {($q_m$, $t_{n+1}$, $M_m$)} be an updated sequence, where $p_j$ is an item, mj is a purchasing money and tj signifies the time at which pj occurs, $1 \le j \le n$ and $t_{j-1} \le t_j$ for $2 \le j \le n$. 'P' denotes a set of items in the database D. A sequence $S_S$={($q_1$, $t_1$, $M_1$),($q_2$, $t_2$, $M_2$),...,($q_m$, $t_m$, $M_m$)} is said to be a progressive compact monetary sequence only if,

(a) item set $S_S$ is a subsequence of S||SU,

(b) $S_S$ should have item qm,

(c) the compactness constraint is satisfied, i.e. $tm - t_1 \le T_C$ and

(d) the monetary constraint is satisfied, i.e. {($M_1$ + $M_2$+ ...+ $M_m$) / m} ≥ Tm.

**1.3.2. Types of Update Operations in Incremental Mining**

There are two types of updates that can be made in Progressive Database. These are insertion of new sequences in database, referred as INSERT in this chapter and appending new item/itemsets in existing sequences referred as APPEND. IN-

SERT is easier to handle as compared APPEND (Cheng et al., 2004). A frequent sequence in 'U' as a result of INSERT operation is either due to this sequence being frequent in 'DB' or in 'db' or in both. So, mining algorithm can be extended to handle INSERT. But, in case of APPEND; appended items may produce new local frequent sequences in 'db'. Even, local infrequent sequences may also contribute their occurrence count in original database 'DB' to generate result as frequent sequences. For example, if there are 1000 sequences in 'DB' and 25 in 'db' with min_sup as 5%. Let, there be sequence, 's' which has 49 occurrences in 'DB' so it is infrequent with 'min_sup' as 4.9%. It is also treated as infrequent with 1 occurrence in 'db' as 'min_sup' would be 4%. It however, becomes frequent in 'U' with 50 occurrences, with 'min_sup' as 5%. As the item/item sets are appended in existing sequences so 'U' have 1000 sequences, even after APPEND.

**1.4**. **Stepwise execution of the algorithm**

Generally, the change on a Progressive Database can be categorized as (a) deleting records, (b) inserting new records and (c) appending new items on the existing records.

By handling these issues, the proposed algorithm was designed with the aid of five major steps.

i. Mining of RFM sequential patterns from the static database

ii. Building up the RFM-tree from the RFM patterns

iii. Handling the update operation

iv. Handling the node deletion operation in the updated RFM-tree

v. Mining of progressive RFM patterns from the progressive database

**1.4.1. Step 1: Mining of RFM Sequential Patterns from the Static Database**

In this, RFM patterns from the static database are efficiently mined using the RFM algorithm proposed in previous chapter. It discovers 1-length compact frequent patterns (1-CF) by considering compactness threshold ($T_C$) and support threshold (min_sup). Then, 1-length sequential patterns (1- RFM) are filtered from mined 1-CF patterns by inputting the monetary constraint ($T_m$). Subsequently, the projected database is built corresponding to the mined 1-CF patterns and 2- CF patterns that are mined from the projected database. Again, we found the 2- RFM sequential patterns from it and the process was applied recursively until all length RFM sequential patterns were mined.

***Example***: The sample database is given in Table 1.1 in which the timestamps T1 to T5 are static set of data, whereas the timestamps T6 to T7 are the updated set of data.

The corresponding monetary values of all the items are given in Table 1.2 and the mined RFM -sequential patterns using our previous algorithm for the input thresholds, (min_sup >=2, TC <= 3, Tm >=10) are shown in Table 1.3.

**1.4.2. Step 2: Building up the RFM-tree from**

**the RFM Patterns**

After the mining process of the RFM-sequential patterns, we have built the RFMtree from the mined RFM-sequential patterns. The process of building up the RFM- tree is explained as follows. The monetary value and the frequency value of each of the patterns should be maintained properly. The RFM tree that contains all the sequential patterns are building up, by which mines the progressive RFM-patterns without candidate generation, requires the less database scans to achieve a highly compact frequency and the monetary tree structure. According to the frequency and monetary list, it produces a RFM-pattern tree, which can store compact information on transactions involving sequential patterns. At first, transactions are inserted into the RFM-tree according to a predefined order one by one. The order of all the patterns of a RFM-tree is maintained by a list, which maintains the current frequency value and the monetary value with the timestamp of each item. Here, each level refers to the length of sequential patterns so the depth of the RFM-tree is identical to the maximum length of the sequential patterns.

***Example:*** The first insertion phase begins with the root node by taking all the mined patterns. By taking the patterns that has prefix 'a', the obtained sequential patterns from the RFM-mining algorithm are <ac>, <acb>, <acc>. Initially, the empty node 'a' is appended with the root node of the tree by giving the corresponding monetary value and the frequency value. When we take the obtained sequential pattern <ac>, here the precious RFM-node 'c' is added to the node 'a' to achieve the building process of <ac>.

The monetary value of 'ac' is considered as 11, which is found to compute the average of heir monetary values. Likewise, all the remaining patterns are utilized to build the RFM pattern tree. The final RFM-tree for the static database is shown in Figure 6.1.

**1.4.3. Step 3: Handling the Update Operation**

After building up the RFM-tree from static database, we have to build the tree structure of the updated sequences. After inserting some of the transactions, if items order of the list deviates from current frequency and monetary to a specified degree, the RFM-tree is dynamically restructured by current frequency and monetary and the list updates the pattern order with the current list. The sequential patterns obtained from the updated sequences are incremented based on timestamps, monetary value and the frequency of each patterns. While updating the tree structure, RFM-tree constantly maintains initial sort order of sequential patterns with their information. Thus, it adds new frequent items at the end of a list and it constructs to maintain the frequency of each item and in tree structure as new nodes. The information about frequency and monetary value should be updated in a timely manner. The timestamp of sequence in the child node should be updated as new one. This is rea-

sonable because for every element between old timestamp and new one, they are already appended to this node as a candidate sequential pattern with old timestamp. Thus, sequential patterns between old timestamp and new one can be found. Additionally, for elements after the new timestamp, appending them to the node having sequence with new timestamp is the only way to find up-to-date sequential patterns beginning at the new timestamp.

***Example:*** By considering the updating nodes of the RFM-tree, the newly inserted items are arrived in a periodic manner. Here, in timestamp T6, the items '<h>' and '<cb>' are the new set of items. We have to update these into the existing RFM-tree dynamically.

While updating '<h>', the progressive compact sequence obtained are <ch>, <(bc)h>, <c(bc)h>, <(bc)(ae)h>, <cbh>, <cch>, <ccah>, <cceh>. These patterns are updated sequentially into the RFM-pattern tree along with the information about the frequency and the monetary value of the updated nodes. Similarly, the other updated sequence, '<cb>' is also updated in the RFM-pattern tree and form the updated RFM-tree. The updated RFM-tree with timestamp T6 is given in Figure 6.2.

In the RFM-tree, the newly updated node to the root node is marked as in dotted line, whereas the update process is done in the existing nodes is indicated as a thin line and the dark line represents the nodes in which there is no update is carried out. For mining the progressive RFM patterns, we have used the user specified thresholds, (min_sup >= 1, $T_C$ <= 4, $T_m$>=10).

**1.4.4. Step 4: Handling the Node Deletion Operation in the Updated RFM-tree**

On mining progressive RFM sequential patterns, the newly arrived patterns may not be identified as frequent one if static database is a larger one. It is noted that users are usually more interested in recent data than old ones. So, deletion of an item from RFMtree is carried out utilizing time information stored in every node. Thus, incompact nodes and the non-zero infrequent nodes should be deleted from the final updated RFM-tree.

***Example:*** To delete obsolete sequences, timestamp stored with each node is considered. We have deleted the incompact nodes, which don't satisfy the user specified threshold, where there is no update process are carried out. As well, we have removed the non-zero infrequent nodes in which the frequent value is less than the threshold. The RFM-tree with no incompact nodes is shown in Figure 6.3.

**1.4.5. Step 5: Mining of RFM Patterns from the Progressive Database**

After the construction of updated RFM-tree, the progressive RFM patterns are mined from it based on the user specified thresholds. Here, tree pattern mining is done that uses top-down process to mine RFM-patterns. The mining process is started from the top nodes of the RFM-tree and

their corresponding paths are extracted from it. Then, by combining the nodes of each level, the progressive RFM patterns are obtained.

***Example:*** From final updated RFM-Tree shown in Figure 6.4, one of the top nodes <bc> and its corresponding paths are extracted. From the paths, each level of nodes are combined so that progressive RFM patterns, {<(bc)>, <(bc)h> < (bc)(ae)h} are obtained. Figure 6.5 (a) shows extracted path for node <bc> and each level with previous level are combined so that RFM patterns can be achieved, shown in Figure 6.5 (b), 6.5 (c) and 6.5 (d). The mined sequential RFM-patterns for all top nodes are given in the Table 6.4.

The pseudo code for the proposed procedure for mining the progressive RFMpatterns is given as follows.

**1.5. PSEUDO CODE**

**Input:** RFM-tree, min_sup, $T_m$

**Output:** A complete set of Progressive RFM patterns

**Assumptions:**

i. m →Number of nodes (next to the root node) in the constructed RFM-tree

ii. min_sup →Minimum support threshold

iii. S_pat→Sequential pattern

iv. PRFM_pat→Progressive RFM-patterns

v. k→Number of distinct paths

vi. D→Depth of the path

vii. pi→Item information in the node

```
begin
for each node 'm' in RFM tree
for ( j = 1; j < k; j ++ )
d [j] = distinctpath. RFM_tree
do_miner (d[j])
if ( support(S_pat*l+)≥ min_sup & Tm)
P RFM_pat << S_pat
endif
endfor
endfor
end
subroutine: do_miner (d[j])
begin
p.l = top node.d[j]
S_pat << p.l
for ( i = 1 ; i < D ; i ++)
p.(i+1) = p.i ‖p.(i+1)
S_pat << p.(i+1)
endfor
end
```

**1.6. EXPERIMENT SETUP AND DATASET DESCRIPTION**

The experiment has been carried out on a 2.9 GHz, dual core PC machine with 1 GB main memory running a 32-bit version of Windows XP for Progressive RFM-Miner and IncSpan algorithms. The proposed incremental mining algorithm has been designed so that it can execute in a distributed environment, which means the updating of data records can be done from multiple sources. So, the algorithm is executed in

thread environment, in which the updating of data records is done in various threads.

***Datasets***: The performances of the algorithms have been evaluated using the synthetic datasets as well as real life datasets (Appendix).

***Synthetic dataset:*** A set of synthetic data sequence is generated by a data generator which is designed for testing sequential pattern mining algorithms. It has been implemented using the concept of IBM data generator. Each data sequence contains a sequence of item sets and different time values are assigned to the items in different item sets. However, same time value is assigned to items which are in the same item sets. A Progressive Database that contains 1000 records with 4 transactions is used for the experiment.

***Real life datasets:*** The UCI machine learning repository is used. This data describes the page visits of users. Visits are recorded at the level of URL category in time order ("frontpage", "news", "tech", "local", "opinion", "on-air", "misc", "weather", "health", "living", "business", "sports", "summary", "bbs" (bulletin board service), "travel", "msn-news", and "msn-sports"). The real dataset with 1000 records of 10 transactions is used for the experiments.

**1.7. Result Analysis**

The experimental results of the proposed algorithm for mining of progressive RFMsequential patterns are described in this section. The experimental results are compared with well-known incremental IncSpan algorithm. The progressive RFM-Miner and IncSpan algorithms were implemented using Java language (jdk 1.7). The Table 1.5 shows the patterns mined by the proposed algorithm and the Incspan algorithm. The Incspan algorithm produced the rules based on frequency of the items. The proposed algorithm mines the most desired and useful sequences compared with the previous algorithm. This is due to the incorporation of the constraints in the Progressive RFM-Miner algorithm.

From the table, most of the sequences containing the 1-length patterns such as <b> and <c> are mined from the database using the proposed algorithm. But, the IncSpan algorithm mined the sequences of having the patterns of <a>, <d>, <g> and <e> as well.

When analyzing these patterns, it can be identified that <h> and <a> have less monetary value. On the other hand, <d>, <g> and <e> are not recently frequent items.

In next section, the performance analysis of the proposed algorithm is done to justify its efficiency which is due incremental mining of sequential patterns from progressive database.

**1.8. Performance Analysis**

The performance of the proposed RFM-Miner algorithm for sequential pattern mining from progressive database is evaluated by three standard evaluation measures. They are,

(a) Number of sequential patterns, that is, the significant number of sequential patterns gener-

ated based upon the given minimum support threshold,

(b) Execution time, that is, the time taken to execute the computer program and the

(c) Memory usage, that is, the memory utilized by the current jobs present in the particular system. The proposed algorithm is compared with the well known incremental algorithm, IncSpan using both the synthetic and the real life datasets.

### 1.8.1 Effect of support values

The experiment results are plotted using graphs from Figure 1.6 to 1.8. Here, the input sequences have been varied in certain time intervals. The generated number of sequences shows better results in our proposed approach as given in Figure 1.6 for both synthetic and real datasets. However, the execution time of the RFM-Miner gets slightly slipped down in some cases than the IncSpan algorithm for synthetic datasets. It maintain the same trend for real datasets by giving better results than the IncSpan algorithm as obvious from graph of Figure 1.7.The effective usage of the memory is given by the proposed algorithm for both types of datasets as shown in Figure 1.8.

## 1.9. Conclusion

An efficient, Progressive RFM-miner algorithm is proposed in this Chapter to handle the maintenance problem of RFM-sequential patterns. An updated RFM-tree is built using the RFM- sequential patterns obtained from the static database to control the dynamic nature of data updating process and deletion process into the sequential pattern mining problem. Subsequently, the database gets updated from the distributed database that may be static, inserted, or deleted. Whenever the database is updated from the multiple sources, RFM tree is also updated by including the updated sequence. The updated RFMtree is used to mine the progressive RFM-patterns using the proposed tree pattern mining algorithm. Eventually, the experimentation is carried out using the synthetic and real life datasets that are given to the progressive RFM-miner using thread environment. The experimental results and analysis provides better results in terms of the evaluation measures over the well – known IncSpan algorithm.

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# Tables

| Seq Id | T1 | T2 | T3 | T4 | T5 | T6 | T7 |
|---|---|---|---|---|---|---|---|
| 01 | a | abc | ac | d | cf | | |
| 02 | ad | c | bc | ae | | h | |
| 03 | f | ab | c | df | cb | | |
| 04 | | g | af | c | b | | |
| 05 | | | | | | cb | |
| 06 | | | | | | | ab |

**Table 1.1 Progressive Database 'PD1'**

| Item | Monetary Value |
|---|---|
| A | 2 |
| B | 10 |
| C | 20 |
| D | 20 |
| E | 5 |
| F | 15 |
| G | 25 |
| H | 2 |

**Table 1.2 Monetary Value Table 'MVT2'**

| RFM-Sequential Pattern | |
|---|---|
| a | <ac>,<acb>,<acc> |
| b | <b>,<bc>,<bcc>,<bcd>,<bcdc> |
| c | <c>,<ca>,<cc> |
| (ab) | <(ab)>,<(ab)c>,<(ab)cc>,<(ab)cd>,<(ab)cdc> |
| (bc) | <(bc)>,<(bc)a> |
| d | <d> |
| f | <f>,<fc> |

**Table 1.3 Mined RFM-Sequential Patterns**

| RFM-patterns | |
|---|---|
| <b> | <b> |
| <c> | <c>, <cc>, <ch> , <cb>, <c(bc)h>, <cbh>, <ccah>, <cch>, <cceh> |
| <(ab)> | <(ab)> |
| <(bc)> | <(bc)>, <(bc)h> <(bc)(ae)h> |
| <(cb)> | <(cb)> |

**Table 1.4 Final progressive RFM-patterns**

| Progressive RFM-patterns | |
|---|---|
| <b> | <b> |
| <c> | <c>, <cc>, <ch> , <cb>, <c(bc)h>, <cbh>, <ccah>, <cch>, <cceh> |
| <(ab)> | <(ab)> |
| <(bc)> | <(bc)>, <(bc)h> <(bc)(ae)h> |
| <(cb)> | <(cb)> |

| Incspan Algorithm | |
|---|---|
| <a> | (ab), ab, ac, (ac), ad, af, (ab)c, (ab)d, (ab)f, aba, aca, acc, adc, |
| <b> | (ba), ba, (bc), bc, bd, bf, (ba)c, (ba)d, (ba)f, (bc)a, bcd, bcc, bcf, bdc. |
| <c> | ca, cb, cd, cf, cdc. |
| <d> | db, dc. |
| <f> | fc, fb, fcb. |

**Table 1.5 Comparison of algorithms in mining of meaningful sequences**

# Figures

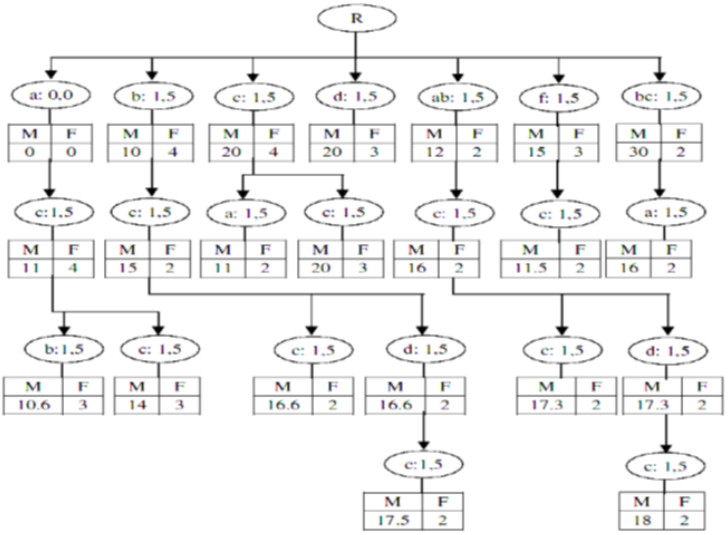


**Figure 1.1 RFM-Pattern Tree for the Static Database**

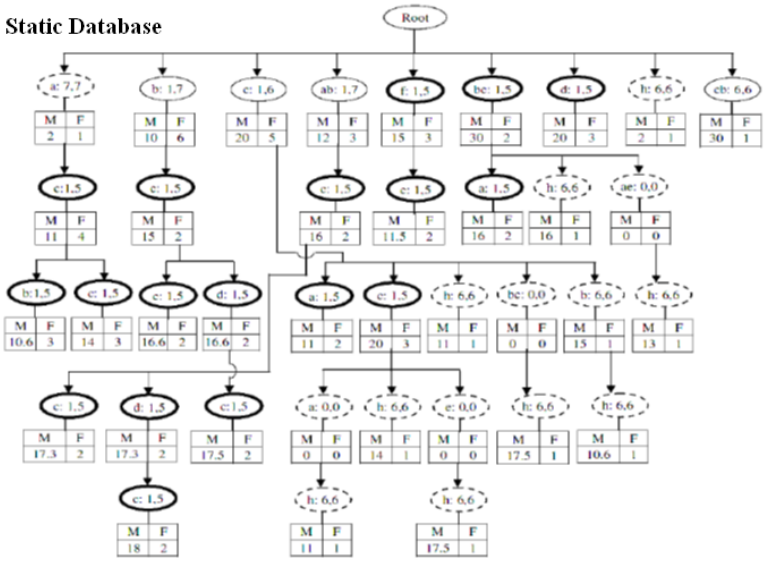


**Figure 1.2 Updated RFM Tree with newly inserted items**

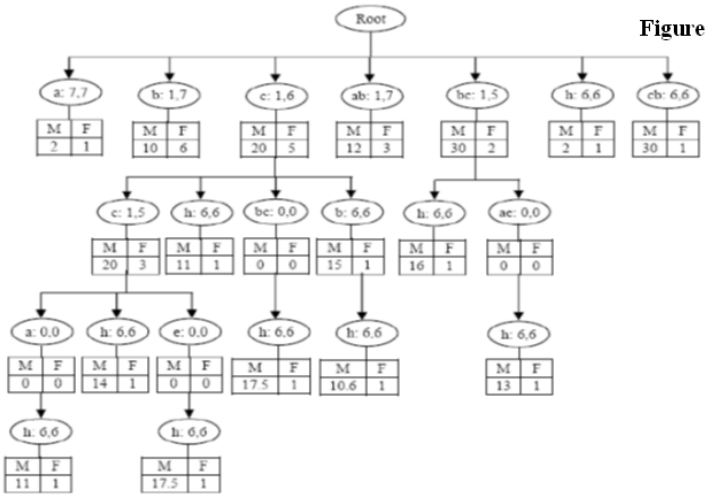


**Figure 1.3 Updated RFM -tree with no Incompact Node**

# Figures

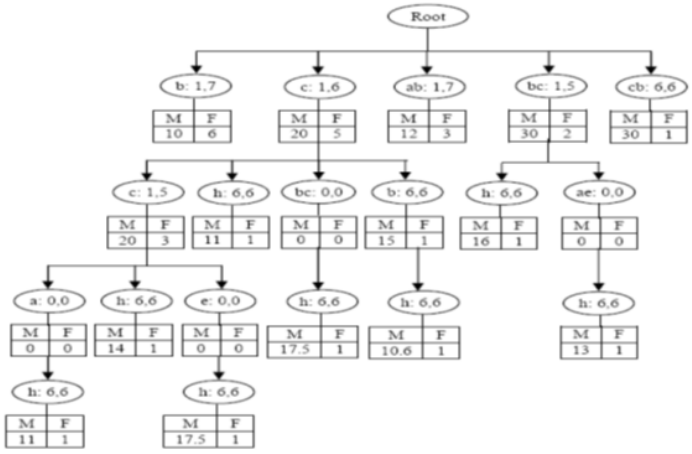


**Figure 1.4 Final updated RFM-tree for progressive database**

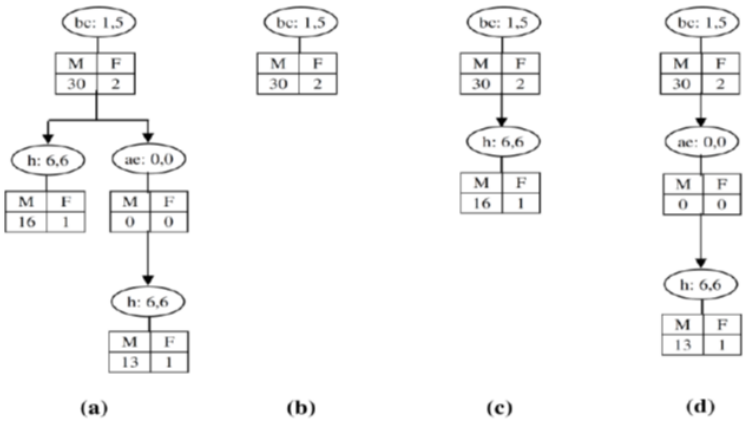


**Figure 1.5 Mining of progressive RFM Patterns from the Updated RFM-tree**

## Figures

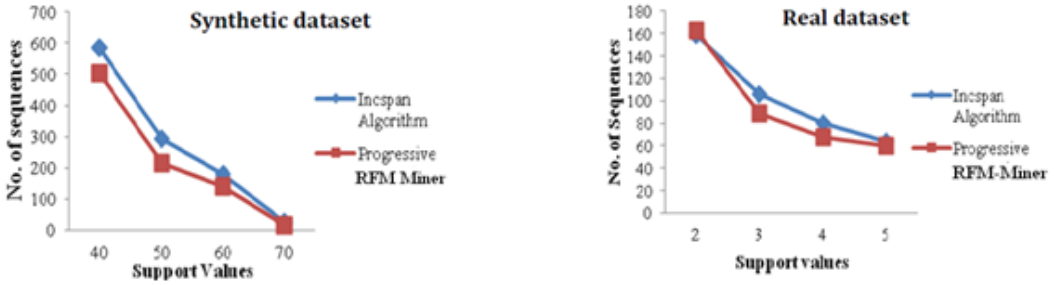


**Figure 1.6 Number of sequences generated by Progressive RFM-Miner and IncSpan with different support values for real and synthetic databases.**

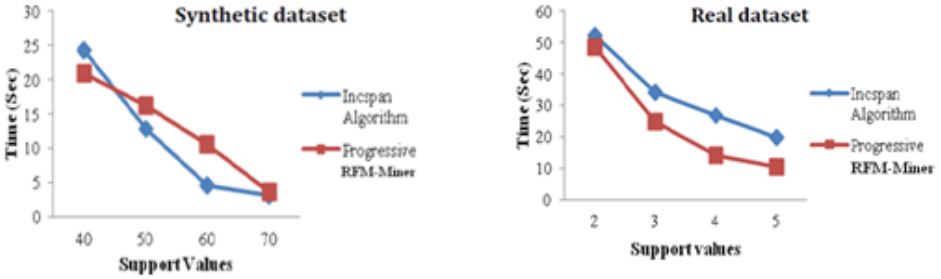


**Figure 1.7 Computation time for Progressive RFM-Miner and IncSpan with different support values for real and synthetic databases.**

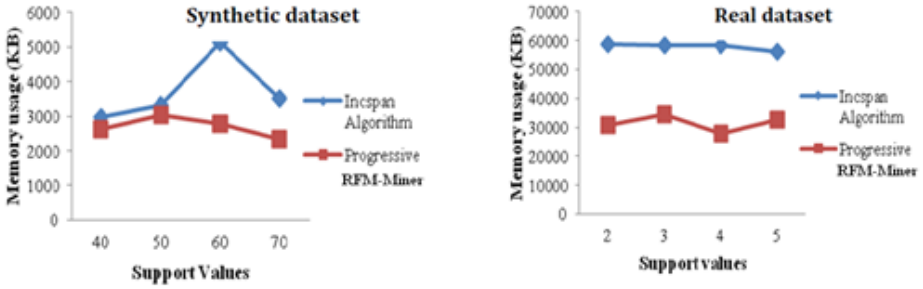


**Figure 1.8 Memory usage of Progressive RFM-Miner and IncSpan with different support value for real and synthetic databases.**

# A Study on Intentional Self Harm in Aichach District Bavaria,Germany

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**Abstract**

*In todays scenario high occupational mobility, high ambition and desire for high standard of living is leading to high incidence of suicidal deaths. Nowadays suicidal gesture, attempted suicide & well successful suicide cases are seen in the society often on. Though the world has developed with the introduction of science and technology no country in the world is totally free from the issue of Self Intentional Harm. No creature on earth can destroy its life by itself other than human being. To-day without any age variation people kill or try to kill themselves using various modes. Through this study the researcher intends to study the level of committing suicide in developed country like Germany. Researcher included the age ,sex ,reasons and different methods of the same under the objectives of study.*

## Introduction

Suicide is not new in human history rather it is as old as humanity itself and its sources reaches far back into the beginning of the culture. It is a specifically human problem. Any animal can die by disease and can be destroyed intentionally or accidentally by an outside agency but as far as we know only man can will his death and kill himself. At some stage of evolution man must have discover that he can kill himself. It is the most personal action, which an individual can take. The study on suicide illustrates that human action, however personal is also interaction with other people and that the individual can not understood in isolation from his social matrix.

Suicide is widely prevalent and no nation and culture has escaped from it, though the toll varies from place to place. The prevalence of suicide in to-days world is quite alarming. In year 2000 about 800000 suicide deaths occurred world-wide. The World Health Organization estimates that more people die each year from suicide than in all the worlds arm conflicts.

The word suicide was first used by Sir Thomas Browne in his ReligioMedici in 1642 and subsequently by Walter Charleton in 1651. Prior to the introduction of word “Suicide” self destruction, self killing and self murder were in practice.

Suicide has been defined by Becketal as, “a willfulself inflicted life threatening act which results in death.”

Schneidman (1976) defined it as, “the human act of self inflicted,self intentional cessation of life”. It is an act committed out of constricted thinking, tunnelled logic and acute anguish.

The world health organization defines sui-cidal act “as the injury with varying degrees of lethal

intent and suicide may be defined as a suicidal act with fatal outcome." Durkheim (1858-1917) defined suicide as "death resulting directly or indirectly from a positive or negative act of the victim himself, which he knows will produce this result." This excludes those who survive the attempt.

Suicide may be defined as, "an intentional act causing harm to a person amounting to death and committed by person himself in the absence of contribution from any external agency particularly in the commencement of act." Recently the term suicide has been replaced by "Intentional Self-Harm"(ISH) in the scientific literature due to derogatory nature of the word "Suicide". Nowadays suicidal gesture, attempted suicide, well successful suicide cases are every now and then we see or hear in the society.

**Aims and objectives**

1. To find out the percentage of age and gender among the victims who committed suicide.
2. To assess various reasons caused for Intentional Self Harm.
3. To assess the methods adopted for suicide.

**Materials and Methods**

The researcher has prepared a questionnaire and interviewed different people who are associated to victims family and collected the data.

**Conclusion**

The researcher has drawn 100 sample from the District of Aichach to make the afore study. The result has shown that among the people of Aichach District in the state of Bavaria the percentage of committing suicide among the men are very higher than the women. The majority among the victims come under the age of 15-25. The study showed that main reasons for the same is love affair and bankruptcy.

**Reference:-**

1. **Durkheim E.** A study in sociology trans by J.A. Spolding& G. Simpson with introduction by Simpson Glancole, 1917, free press.
2. **Schneidman E.** Definition of suicide; Jason Aronson 1977.
3. World Health Organisation. Facts and Figures aboutsuicides. Geneva;WHO:1999. http://www.who.int/mental_health/media/en/382.pdf.4
4..Bertolote JM, Fleischmann A, De Leo D, WassermanD. Psychiatric diagnoses and suicide: revisiting evidence.Crisis 2004;25:147-55.

# Tables

TABLE 01

**INTENTIONAL SELF HARM ON AGE AND GENDER WISE**

| Class Interval | Frequency | Frequency |
|---|---|---|
| | *Male* | *Female* |
| 0-14 | 00 | 00 |
| 15-29 | 61 | 01 |
| 30-44 | 21 | 03 |
| 45-59 | 12 | 02 |

TABLE-02

**INTENTIONAL SELF HARM ON REASON WISE**

| *REASONS* | *MALE* | *FEMALE* |
|---|---|---|
| Family Problem | 08 | 02 |
| Love Affair | 45 | 00 |
| Bankruptcy | 31 | 03 |
| illness | 08 | 03 |

TABLE-03

**INTENTIONAL SELF HARM ON METHOD WISE**

| METHODS | MALE | FEMALE |
|---|---|---|
| Hanging | 48 | 02 |
| Poisoning | 32 | 05 |
| Self immolation | 10 | 03 |
| | | |

# Figures

Figure-1

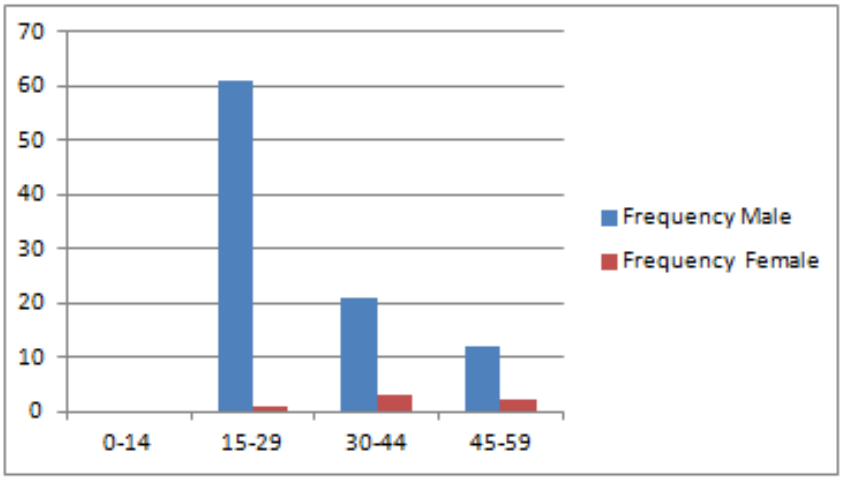



Figure-2

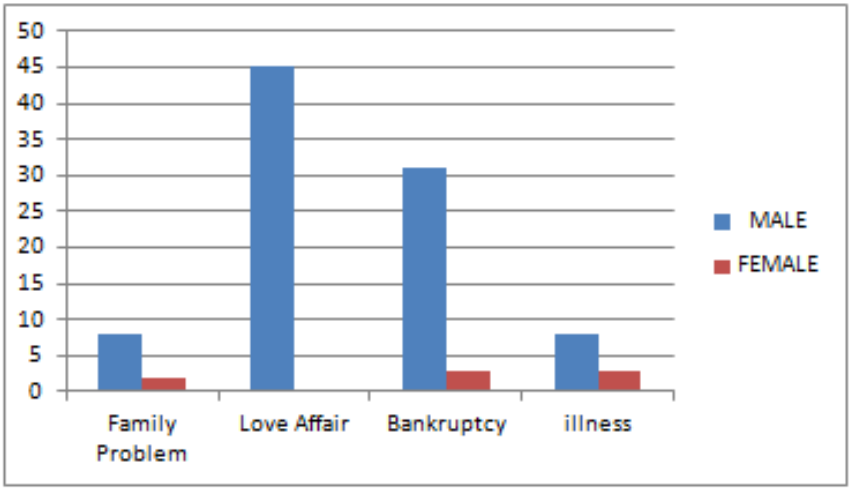
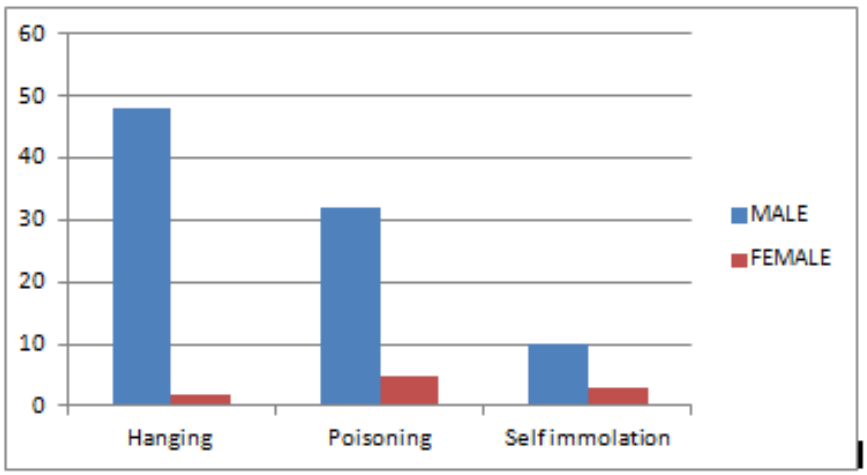



Figure-3



# Incorporating Fuzziness in Incremental Mining of Sequential Patterns

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**Abstract**

*In this paper we present the need for methods that help the user to process, retrieve, exploit and clarify the available knowledge in a simple way. Fuzzy sequential mining is used to get knowledge regarding order of the mining results. The sequential mined results need to be represented and maintained with timestamp. This can be done efficiently using the lattice-theoretic framework. The lattice can be represented using the undirected graph to get the fuzzy sequential patterns and consequently useful knowledge for business applications and otherwise. The use of lattice representation avoids scanning of the database for mining patterns. The entire database is scanned once to build the lattice structure which is an intermediate data structure in the memory. This reduces the computational time. This is a temporary data structure generated by the algorithm for its own further use for sequential pattern mining.*

## 1.1. Introduction

Sequential pattern mining is new but an interdisciplinary field utilizing statistics, machine learning, and other methods. In recent years, fuzzy logic has also been applied to augment pattern mining. The application of fuzzy logics makes mining results more understandable and interpretable, apart from being useful and informative. Fuzzy rules are useful to summarize large databases as they mine rules with timing information, called fuzzy sequential patterns. The main challenge for the end users who work with large databases is to retrieve concise and understandable summaries. The use of fuzzy logic can help to extract and maintain rules and summaries from huge databases. This is achieved by first deriving linguistic summaries for the database and extending it further to fuzzy summaries. The user interaction is also useful to get interesting information along with different methods. The use of lattice structure for the summarization of fuzzy sequential patterns is proposed. The different item sets of a sequence can be hierarchically grouped together satisfying properties of mathematical lattice structure and hence can be used for knowledge extraction. Business and real-time databases mostly have numerical data that is time stamped. In recent times, the fuzzy set theory utilization has reduced bleak cuts over the period, and hence provides more relevant rules. An efficient algorithm, PLM (**P**rogres**L**attice **M**iner) for incremental mining of fuzzy sequential pattern mining from progressive database is proposed. The procedure is not directly carried

out from progressive database, since it takes more time due to scanning required to find the support. Instead, a ProgresLattice structure is built that utilize standard lattice structure to reduce the scanning time required to mine the patterns effectively. The mining procedure gives better computation time as only a single scan is required to build the lattice structure. Particularly, some approaches were proposed to extract fuzzy sequential patterns within the historically stamped quantitative data (Chen *et al*., 2001; Hu *et al*., 2004; Fiot *et al*., 2006b; Huang *et al.,* 2010). However, to the best of our knowledge, there is no study made for incremental mining of fuzzy sequential patterns from progressive databases.

**1.2 Motivation for the use of fuzzy sequential patterns**

This has been noticeably observed that the real-world databases consist of numerical and time-stamped data. We can get more relevant rules from these databases by making use of fuzzy set theory to minimize the sharp cuts between intervals. The sequential pattern mining is based on binary valued transaction data. This should however be extended to fuzzy sequential pattern mining for quantitative valued data. Fuzzy sequential mining generate simple and practical patterns which are close to human reasoning. The term fuzzy was introduced by Zadeh (1965) and further studied to state that there could be additional zone apart from only true and false. The concept of fuzzy provides flexibility to model imprecisely defined conditions. It allows for approximate reasoning that is useful for expert systems with powerful reasoning capabilities. In fact, the logic behind any thought process is hardly two valued but based on imprecise and unclear truths and rules of inference. A fuzzy set theory is a logical extension of a crisp set. Crisp sets have only two values, 0 or 1, that means an object may have no membership or complete membership. On the contrary, fuzzy set theory allows for any value between 0 and 1 and an object may have partial membership. This is done by introducing gradual memberships for the quantitative data using membership functions. Therefore, each quantitative item has to be partitioned into several fuzzy sets to mine fuzzy sequential patterns (Chen *et al*., 2001). This redefines the concept of attribute and itemset as compared to classical sequential patterns. The association of one item (attribute) and corresponding fuzzy set formulates the fuzzy item.

***Example:*** Table 1.1 has 4 sequences of customer transactions showing purchases of hardware, software and accessories items from a computer shop.

The software purchased by the customer can be modeled with [number, low] as a fuzzy item where low is a fuzzy set defined by a membership function on the software universe of possible values of the item ‘number’. The list of fuzzy items is called a fuzzy itemset denoted as a pair

of sets (set of items, set of fuzzy sets associated to each item) (Hu *et al*., 2003). To elaborate, ([number, low][quantity, small+) is a fuzzy itemset having two fuzzy item 'number' and 'quantity' for quantitative items 'software' and 'hardware' respectively. One fuzzy itemset contains only one fuzzy item related to one single attribute. A s-f-sequence S =< s1…sg > is a sequence constituted by's' fuzzy itemsets s = (X, A) grouping together 'f' fuzzy items *x, a+. The sequence < ([number, low][ quantity, small]) ([accessories, many]) > groups together 3 fuzzy items into 2 itemsets. It is a fuzzy 2-3-sequence.

**1.3. Fuzzy sequential patterns summarization**

Mining fuzzy rules is one of the best ways to summarize large databases while keeping information as clear and understandable as possible for the end-user. The common approach to express such knowledge consists in deriving linguistic summaries, which can further be extended to fuzzy summaries. Such summarization often requires a user interaction for quality and validity in order to select interesting and useful knowledge from the huge datasets. There are few methods based on functional dependencies or association rule mining that perform summarization using automatic generation.

However these methods are useful for quantifying and reasoning (Hu et al., 2004). For applications where it is vital to mine rules that express information about the order fuzzy sequential patterns summarization is helpful. Initially, the fuzzy partitions are created for each of the numerical attributes in the given crisp dataset. Then, using these fuzzy partitions, the fuzzy version of the dataset are created by converting crisp numerical attributes and its associated numerical values into fuzzy attributes and its associated values/ membership degrees. Fuzzy sequential pattern mining is a significant approach, which deals with temporally annotated numerical data (Chen and Hu, 2002). It allows mining of frequent sequences embedded in the records. However, such fuzzy sequential patterns, in their current form, do not allow extracting temporal tendencies that are typical of sequential data (Fiot et al., 2006a). We can elaborate this by considering the example Table 1.1, and deriving the fuzzy sets for it. Table 1.1 has been parsed to see the frequency of purchases made for the hardware, software and accessories items from a computer retail shop. The results derived from this parsing are being shown in Table 1.2. The hardware item/s that cannot be placed on the slots of the motherboard has been considered as accessories.

The reduction of item sets in the mining process is possible due to the role of fuzzy sets that transform quantitative values into linguistic terms. An object or item may either belong to a particular set or not, in case of classical set theory. However, the fuzzy set theory makes it possible that the object can even belong to a set to a certain degree. This is achieved by using the linguistic

knowledge for the property that defines the set. Membership degrees indicate resemblance, ambiguity and inclination of an object with the corresponding set. The quantitative attributes are first divided into fuzzy sets using linguistic terms like small, moderate, medium, large etc. We further use the membership functions to get the membership degrees for each attribute and fuzzy set. There are different types of membership functions that can be used like triangular, trapezoidal, bell shaped, gaussian curves, polynomial curves, sigmoid function. By making use of membership function and linguistic knowledge, the fuzzy sets for each attribute are formulated, as given in Figure 1.1 (a), (b) and (c) for our example of Table 1.2.

As shown above, a membership function is a curve to represent each point of the input space with a membership value, that is, degree of membership between 0 and 1. As an example, consider fuzzy sets small, few and high for universe of discourse hardware with attribute as 'quantity'. With a crisp set, hardware quantity of '0', '1' is considered as 'small', '2' as 'few' and any quantity '4' and 'above' is considered as 'high'. However, it is not clear that the hardware quantity of 3 purchased by customer is to be treated as which type of set. For a given membership function the fuzzy set is shown in Figure 1.1 (a). The curve gives the transition from few to high quantity of hardware with the membership degree. Figure 1.1 (b) and 1.1(c) shows the fuzzy sets for 'number' attribute of software and accessories respectively. The fuzzy membership function is applied according to the measurements of spatial relations in order to examine and compare the resemblance between mining result and real spatial configuration. Subsequently, fuzzy comprehensive judgment of mining results is conducted based on correlative fuzzy theory. Usually the membership functions are selected by the user with his experience or sometimes even randomly. Therefore, the membership function chosen by two users could be different depending upon their experiences, perspectives and more. They can be also designed using machine learning methods like artificial neural networks, genetic algorithms. The following factors are considered to determine fuzzy membership functions,

i. The membership function defines the fuzzy set.

ii. A measure of the degree of similarity of an object to its corresponding fuzzy set is given by the membership function.

iii. Membership functions are of different types and forms.

Fuzzy sets can be used to (i) illustrate the relationship between data (ii) represent different types of associations (iii) facilitate to give mining rules in linguistic terms and (iv) prevent abrupt boundaries when dividing the attribute domains. It is obvious that an element can belong to more than one fuzzy set at a time. So, a

fuzzy set 'A' in universe 'U' may be represented as a set of ordered pairs. Each pair consists of a generic element 'E' having a linguistic variable 'x' and its grade of membership 'm'. For given Progressive Database 'D', ,S100. high, 1} shows that sequence identifier 'S100' has '1' degree membership for fuzzy set 'high', and ,S300.few, 0.5} represents 'S300' has a membership degree of '0.5' for fuzzy set 'few' for hardware. The membership degrees of all attributes for customer sequences are summarized Table 1.3.

**1.4. Role of lattice structure**

Lattice is an important concept of discrete mathematics. The lattice is characterized by specific properties which makes it quite different from other data structures like graph, tree (Kumar *et al*., 1995). We can make use of this structure to represent and maintain the fuzzy sequential patterns. The typical definition of the lattice as given by mathematical theory is:

Let (P, ⊑) be a partially order set and A ⊆ P a subset of P. An element p Є P is called an upper bound for A if a ⊑ p for all a Є A. It is called a lower bound for A if p ⊑ a for all a Є A. If the set of all upper bounds of A has a smallest element, then this element is called the join or supremum or least upper bound of A. Similarly the largest lower bound of A (if it exists) is called the meet or infimum or greatest lower bound of A. For example, if we consider the set N of natural numbers with order relation |, ,is a divisor of". Then the supremum of two elements a, b Є N equals lcm (a, b). The greatest common divisor gcd(a, b) is the infimum of {a, b}.A partially ordered set or poset (P, ⊑) is called a lattice, if for all x, y Є P the subset ,x, y}of P has a supremum and an infimum. The supremum of x and y is denoted by x ⊔y and the infimum as x ⊓ y. We can say, (R, ≤) is a lattice, if x, y Є R, then sup,x, y} = max,x, y} and inf,x, y} = min,x, y}. Similarly, if S is a set and P = P(S) the poset of all subsets of S with relation ⊆, then P is a lattice with ⊔= ⋃ and ⊓=⋂. As stated before, if (P, ⊑) is a lattice, then for all x, y, z Є P has certain properties (Huaiguo *et al*., 2008) as;

i. x ⊔ x = x and x ⊓ x = x; (Reflexive)

ii. x ⊔ y = y ⊔ x and x ⊓ y = y ⊓ x; (Symmetric)

iii. x ⊔ (y ⊔ z) = (x ⊔ y) ⊔ z and x ⊓ (y ⊓ z) = (x ⊓ y) ⊓ z; (Transitive)

A lattice in which every subset has a supremum and infimum, is called a complete lattice. We can represent this visually by means of directed acyclic graph. This graph has nodes which represents elements of the poset and there is directed arc from node y to node x if and only if y ⊑ x. This type of graph is called as Hasse diagram that is used to represent a poset (Zhang *et al*., 2008b). Usually the direction of arcs in the graph are avoided by showing node x above node y if y ⊏ x. So, the lattice can be used to represent the order relation or the hierarchical order of elements. This data structure could be useful for the fuzzy summarization of the sequential pattern once the fuzzy set has been formulated using the

linguistic knowledge and each data element is associated with the membership degree with these fuzzy sets using the membership function.

Considering a domain of discourse in which each element of a set of sequence of transaction, SID ={s1, s2, <, sn} have one or more attributes ATT= {a1, a2, <, am}. We have triple F = <SID, ATT, M>, where M is a membership degree attained by a particular sequence identifier for a specific attribute. This membership degree is derived by using some membership function. For example in Table 1.3, we can define a database D = <P, ⊑ > related to triple F as consisting of a set P, of sequences of transactions which are partially ordered by the relation ⊑. The database is restricted as the attributes (ATT) in F form the maximal elements and the sequences of transactions (SID) in F are the minimal elements. We can represent this database as in Figure 1.2.

However the above graph has a key limitation, that is, when the ascending paths of two different nodes are followed, it is not necessary that we will reach to one single common node at their top. For instance, by ascending path from 'S300' and 'S400' we reach to node 'few' as well as 'high'. It is very unclear and ambiguous that whether the sequence 'S300' has feature of attribute 'few' or 'high'. In fact due to fuzziness it has features of both the attributes that is 'few' and 'high' to certain membership degree. This is not reflected by the use of the graph. Making use of lattice structure, P, with a property that every two elements of P have a least upper bound, called join or supremum and greatest lower bound known as meet or infimum we can take care of this problem. This typical feature that there would be always one single supremum for any two nodes in the lattice is termed as a closure property of lattice. This often may require adding some extra nodes to achieve the consistency of the system. The lattice theory ensures that these extra nodes, added as 'artificial' supremum of two closed sets will consist on the union of the maximal sequences that are contained by their immediate predecessors. We can have following lattice structure represented using the Hasse diagram in Figure 1.3 for the Table 1.3 with added nodes;

The fuzziness in the sequences for attributes is reflected by using the lattice structure. It has good properties involving the completeness of pairs and independence of the order of input variable or the attributes. No doubt, lattice structure is a robust tool that can be utilized for data analysis and knowledge discovery.

### 1.5. Progres Lattice Miner (PLM): proposed algorithm for incremental mining of fuzzy sequential patterns

This section proposes an algorithm, Progress Lattice Miner (PLM) which integrates the concepts of fuzzy sets and incremental mining to find interesting sequential patterns from dynamic progressive transaction database. The limited number of existing algorithms for sequential pat-

tern mining from progressive database cannot cope for quantitative data. This is the first study (to the best of our knowledge) to find the fuzzy sequential patterns from the progressive database. The algorithm use lattice structure to store data along with frequency and support count. The following sections discuss the algorithm in detail.

**1.5.1. Preliminaries**

The formal definitions of some of the most relevant terms are presented below;

i. ***Fuzzy item***: It is the association of one item and one fuzzy set. It is denoted by [x,a], where *x* is the item (also called attribute) and *a* is the associated fuzzy set. For example, [length, short] is a fuzzy item where short is a fuzzy set that is given by a membership function on the quantity universe of the possible values of the item length.

ii. ***Fuzzy itemset***: It is a set of fuzzy items. It can be denoted as a pair of sets (set of items, set of fuzzy sets associated to each item) or as a list of fuzzy items. We will note, $\{X, A\}=([x_1,a_1],..., [xp,ap])$ , where *X* is a set of items, *A* is a set of corresponding fuzzy sets and [*xi* ,*ai* ] are fuzzy items.

iii. ***Lattice:*** A partially ordered set (poset) is a set *L* with a reflexive, symmetric, transitive relation. A poset *L* is a complete lattice if every subset $S \in L$ has a least upper bound $\acute{U}S$ (join) and a greatest lower bound $\grave{U}S$ (meet). A poset *L* is a lattice if every two elements of *L* have a join and a meet. These meets and joins of binary sets will be written in infix notation, $\acute{U}(x, y) = x\acute{U}y$ and $\grave{U}(x, y) = x \grave{U} y$ .

iv. ***Lattice support*** *Ls* **:** Let *I* be the set of items and *v*(*i*) be the value of attribute *i* in record. Each attribute *i* is divided into fuzzy sets. Then one record in a fuzzy Progressive Database consists of the membership degrees of each attribute to each fuzzy set, e.g $r(x,a) = f(x)$ represents the membership degree of item/attribute *x* to the fuzzy set *a* in record. The support of a fuzzy sequence *S* is then computed by the formula: $Ls = F / N$ , where *F* is the fuzzy membership value and N is the number of records. The maximum operator is used to calculate lattice support for an item with more than one membership degree in a record.

v. ***ProgresLattice:*** It is a data structure used in the proposed algorithm to mine the fuzzy sequential patterns from progressive database. We make use of the traditional lattice structure which, hold much good properties and utilized it for mining frequent patterns, including the completeness of pairs in the lattice, the independence of the order of input variables or attributes, and the convenience of combining with domain knowledge.

vi. ***PLM (ProgresLattice Miner):*** It is a mining technique for fuzzy sequential pattern mining from ProgresLattice. It has the ability to be applied to various fields.

vii. ***Fuzzy* sequential pattern:** It is a type of

knowledge representation with fuzzy occurrence order information of items. It can also be defined as the fuzzy rules that describe the evolution of data over time.

viii. ***Positive Fuzzy* sequential pattern:** A fuzzy sequential pattern is called as a positive fuzzy sequential pattern when it expresses only the occurrences of the fuzzy itemsets.

ix. ***Negative Fuzzy* sequential pattern:** A fuzzy sequential pattern is called as a negative fuzzy sequential pattern when it also expresses the absences of fuzzy itemsets.

**1.5.2. Phases of the Algorithm**

The proposed PLM (Progreslattice Miner) is mainly achieved in the following three phases as represented with the model given in Figure 1.4.

This fuzzy sequential pattern mining algorithms is achieved using three main phases:

i. Finding fuzzy membership value for each transaction of progressive database.

ii. Building a ProgresLattice structure with the aid of standard lattice structure.

iii. Mining of fuzzy sequential patterns from ProgresLattice structure.

**1.5.3. Stepwise execution**

The detailed steps of algorithm for the proposed ProgresLattice Mimer for mining fuzzy sequential patterns are;

**Algorithm:** ***ProgresLattice Miner algorithm (PLM)***

**Input:** a) A specified database, DB.

b) User specified minimum fuzzy support and threshold value.

**Output:** Phase I: Fuzzy membership values of the transaction.

Phase II: Progreslattice data structure.

Phase III: Fuzzy sequential patterns.

**Method:**

***Phase I:* Finding fuzzy membership values of transactions on progressive database.**

**Step 1.** Identify the membership function to transform transactions of progressive database.

**Step 2.** Define the fuzzy partition set for each of the numerical transaction value.

**Step 3.** Identify and formulate the parameters for fuzzy partition set using linguistic terms.

**Step 4.** Calculate membership value for each transaction using the membership function identified in Step 1.

**Step 5**. Associate membership values of each transaction with fuzzy partitions using linguistic terms.

**Step 6**. Goto Phase II with the computed fuzzy sequences and their membership values.

***Phase II*: Buiding a Progreslattice structure with the help of standard lattice structure.**

**Step 7.** Construct a lattice such that it satisfies

**a)** the closure property, that is, any two nodes must have single supremum. So, by following the ascending paths of two different nodes we will reach one single common node on the top. It operates as follows: given *DB*, the closure of a set of sequences $S$ , i.e. $\Delta(S)$, includes all the maximal sequences that are present in all the

transactions $db \hat{I} DB$ where sequences in $S$ are contained.

**b)** add some extra nodes to ensure the fulfilment of Step 7a) and the consistency of the system. These extra nodes added as artificial supremum of two closed sets will consist on the union of the maximal sequences contained by their immediate predecessors. This avoids to scan the input sequences in DB for completing the lattice.

**c)** the property of monotonicity, that is, preserve the order which is vital for fuzzy sequential pattern.

**d)** of being extensive, that is, it covers all transactions and is completely thorough.

**e)** of being idempotent with the addition and deletion of nodes.

**f)** to store the frequency and lattice support values by each node. The maximum operator is used to calculate the lattice support when a node has more than one membership degree.

**Step 8**. The lattice will exhibit the tendencies of the data from top to bottom: nodes located in the top part of the lattice correspond to concepts/ patterns with a support, thus the semantic split performed between the concepts of the same level is more significant. On the other hand, the nodes located in the bottom of the lattice represent the unifying concepts of the different tendencies coming from the top.

**Step 9**. Handle the updates from the existing sequence (append) in the lattice structure:

**a)** Consider the frequency and the lattice support to insert the new node in the lattice structure at an appropriate level, maintaining the length of the subsequent subsequence.

**b)** While creating the subsequent node of this sequence, increment the frequency with the existing same set of sequence nodes and update their lattice support.

**c)** Update the frequency of fuzzy sequence in the Progress lattice, if this appended sequence already exists. However, there is no change in the lattice support, as number of records remain unchanged.

**Step 10.** Handle the updates from the new sequence (insert) in the lattice structure:

**a)** Add the sequence directly with the root node.

**b)** The corresponding frequency and lattice support values are stored

**c)** Update the frequency of the fuzzy sequence in the ProgresLattice, if it already exists.

**d)** Update the lattice support values of all the nodes of the ProgresLattice, as the number of records increase with each new sequence.

**Step 11**. Handle the delete operation in the lattice structure:

a) The required nodes of the sequence is deleted if a set of items are to be removed.

The frequency of the subsequent nodes are decreased from top to bottom in the ProgresLattice for the node that is deleted.

b) If a complete record of an item is to be deleted is to be deleted, then the complete sequence for that node is removed and the frequency is up-

dated for the corresponding other sequences. However, the lattice support for all the nodes has to be updated in this case, as there is decrease in the number of records.

***Phase III*: Mining of fuzzy sequential patterns from the ProgresLattice structure.**

**Step 12**. Examine the frequent prefix subsequence with corresponding postfix subsequence in the constructed Progreslattice as in Phase II.

**Step 13**. Traverse each level of depth of the Progreslattice and generate all possible sequences that include nodes in that specific level.

**Step 14**. Consider the minimum support threshold and lattice support to determine the frequent fuzzy sequential patterns among all the mined sequential patterns at each level.

### 1.5.4. An Illustrative example

In this section, an example is given to illustrate the proposed fuzzy sequential pattern mining algorithm. The dataset in Table 1.4 is a simple example to show how the proposed PLM algorithm is used to generate interesting fuzzy sequential patterns for customer purchasing behaviour according to historical data. The quantitative progressive transaction data in Table 1.5 consists of transactions of seven customers and five items, denoted as 'a' to 'e'. The timestamps value from T2 to T6 and first four customer transactions are considered as part of static database. The timestamps from T8 to T11 are dynamically appended in the database. On the other hand, last three customer transactions are inserted in the database on the fly. We assume the fuzzy membership function is the same for all the items. It has been taken as the triangular membership function for this example.

**Phase I.** The formula $f(x)$ given in Figure 1.5 calculates the membership values for the transaction database of Table 1.4. In this example, the fuzzification is done in the time of arrival instead of frequency of certain quantitative sequences, the frequency of sequences with minimum relevancy, weighted frequency. The purchase sequences given in Table 1.5 is given on the timestamps of monthly basis. These sequences ought to be converted into fuzzy partition sets with their computed membership values with respect to every timestamps. The three defined parametes utlized to compute the membership values are *Low (L), Medium(M) and High (H)*. The predicted values of each items are computed by utilizing the function $f(x)$ where $a$ , $b$ and $c$ represent the $x$ coordinates of the three vertices of $f(x)$ in a fuzzy set A (a: lower boundary and c: upper boundary where membership degree is zero, b: the centre where membership degree is 1). The standard triangular function is given in Figure 1.6.

The triangular membership functions with defined parameters and their values for our example is depicted in Figure 1.7. The *Low* parameter has a=0, b=3.5, c=5 values to reflect the timestamps of transactions, while *Medium* has a=3.5,

b=5, c=8.5 and *High* has a=5, b=8.5, c=12 values.

Table 1.5 describes the fuzzy sequences transformed from progressive database with their computed membership values. Here, the membership values of the item b.L with T4, where x=4, a= 0, b= 3.5, c= 5 is 0.7, and 0.3 for b.M. Similarly, we have found out other membership values for the three parameters of all customer transactions and generate corresponding fuzzy sequences.

The attained subsequent branch nodes are (c, d: M), (b, d: M), (b, c: M) and (d: M), (c: M), (b: M). Similarly, we build the lattice structure with the other corresponding sequences.

The lattice support is also updated along with the frequency in every node, keeping the tendencies of the data from top to bottom. The nodes located in the bottom of the lattice represent the unifying concepts of the different tendencies coming from the top.

Yet, to guarantee that the lattice is a closure system, we need to check any two nodes must have one single supremum, that is, following the ascending paths of two different nodes we will reach one single common node being their top. To fulfill this condition, we need to add some extra nodes. These artificial supremum of two closed sets, will consist on the union of the maximal sequences contained by their immediate predecessors, so that there is no need to scan the input sequences in *DB*for completing the lattice. The addition of (c, d: M) is an artificial supremum to satisfy the closure property, though (b, d: M) and (b, c: M) nodes reflect corresponding fuzzy sequences of the database. The lattice structure is given in Figure 1.8.

**1.5.4.1 Updating an existing sequence (append) of the ProgresLattice structure**

If the same customer updates the data, then it is the data updates in the same record. This problem complicates the incremental mining since one cannot ignore the infrequent sequences in ‘db’, but there are an exponential number of infrequent sequences even in a small ‘db’ and checking them against the set of infrequent sequences in ‘DB’ is very costly. The Figure 1.9 is derived from the Table 1.5, in which the fuzzy sequences are converted into the lattice structure with their updated data as well. Here, for timestamp ‘T8’, there is newly updated data from the same customer 02, that is, fuzzy item ‘d’.

**Figure 1.9 Complete lattice structures with updating in the existing customer**

As shown in the Figure 1.9, the sequences, (b, d: M), is already present in the lattice so the frequency of this node is increased by one. However, a new node for fuzzy sequence (d: H) is added to construct the ProgresLattice structure. Considering the updating done from T8 to T11, the four customers, with id 01 to 04 give new fuzzy sequences, (d, e, a : H) and (e, b, c : H). The corresponding new nodes are added to the root node in the ProgresLattice of 3-length se-

quences. Here, while creating the subsequent node of this sequence, the frequencies get incremented with the existing same set of sequence nodes like (b, d: M), (d, a: H), (a: H). Here we need to compare it with all existing nodes.

However the lattice support for new added nodes needs to be updated. Many nodes like (d, e : H), (c, a : H), (e, a : H) are added to satisfy the closure property. Similarly, all the fuzzy sequences get updated in the ProgresLattice tree based on the frequency and the lattice support for all customers.

**1.5.4.2. Updating new sequence (insert) in the ProgresLattice structure**

It is much easier to handle this case, that is, INSERT, which means the updates happening from the new sequences, added in the database. An important property of INSERT is that a frequent sequence in U = DB ∪ db must be frequent in either DB or db (or both). If a sequence is infrequent in both DB and db, it cannot be frequent in U. Thus, only those patterns that are frequent in db but infrequent in DB need to be searched in DB to find their occurrence count. Suppose, there is an update from the new sequence like customer 05, the sequences are directly added into the root node with the corresponding frequency along with the lattice support. Here, in the Figure 1.7, the sequence (d, ac: H) with the branch nodes are the newly added one. However, the frequency of (c, b ; L) and ( b, d : M) is incremented as these nodes exist in the lattice structure. The lattice support for all fuzzy sequences is updated as the number of records increased from 4 to 5 with addition of fifth customer.

We can do the similar operation for other two new customers 06 and 07, though we have avoided the changes in Figure 1.10 to maintain the simplicity of the figure.

**1.5.4.3. Updating due to the deletion operation in the ProgresLattice structure**

There are two types of possibilities with the deletion operation, either a complete sequence can be removed or a set of items be removed from the progressive database with time. In case, if a customer sequence is deleted for our example, corresponding sequence from root node till leaf node is removed from the ProgresLattice and the frequency of existing nodes in other sequences is decremented. However, if a set of items are deleted from the database, then we need to carefully select the corresponding node in the ProgresLattice for deletion and further decrease the frequency of subsequent node or remove them completly (if frequency is 1 for them). The other case is little tricky. For our fuzzy database, if with time, we need to remove the timestamp $T_2$ for all customers, then we need to delete ( c : L) and (c, b ; L) nodes from the ProgresLattice structure and decrease the frequency of (a : L) by one. The complete lattice for the progressive fuzzy database after deletion is given in Figure 1.11

**Phase III**. Its general idea to examine only the frequent prefix subsequences and project only their corresponding postfix subsequences into projected databases because any frequent subsequence can always be found by growing a frequent prefix. The ProgresLattice tree structure provides an efficient structure for mining, although the combinatorial problem of mining sequential patterns still has to be solved.

To discover all sequential patterns, the ProgresLattice takes a look at each level of depth of the lattice structure and generate all possible sequences that include nodes in that specific level. After having mined the sequential patterns for every level of considering the minimum support threshold and fuzzy lattice support, they are stored in the complete set of patterns. Here, the resultant frequent sequences which meet the minimum threshold support value of 2 and fuzzy lattice support value of 0.1 are listed as below. The sequence of 2- length pattern (b, d: M) and (c, b: L) satisfies both the threshold and the sub-nodes along with other nodes are considered here as the frequent fuzzy sequential patterns given in Table 1.6.

However, the above patterns are true for incremental databases. When we consider the old and obsolete data of timestamp T2 are removed from the database, (c, b : L), (c : L) and (a : L), we get more relevant and interesting patterns from the progressive database as given in Table 1.7.

**1.5.5. Experimental Setup and Dataset Description**

The experiment has been carried out on a 2.9 GHz, dual core PC machine with 1 GB main memory running a 32-bit version of Windows XP for ProgresLattice Miner and Nancy P.'s algorithms. The proposed incremental mining algorithm has been designed so that they can execute in a distributed environment, which means the updating of data records can be done from the multiple sources. So, we run the algorithm in thread environment, in which the updating of data records is done in various threads.

***Datasets***: The performances of the algorithms have been evaluated using the synthetic datasets as well as real life datasets.

***Synthetic dataset:*** A set of synthetic data sequence is generated by a data generator similar in spirit to the IBM data generator designed for testing sequential pattern mining algorithms. Each data sequence contains a sequence of item sets. However, different time values are assigned to the items in different item sets but the same time values to those in the same item sets. A dataset of 1000 records with 4 transactions are compared.

***Real life datasets:*** The UCI machine learning repository is used for the implementation of all algorithms. This data describes the page visits of users who visited msnbc.com. Visits are recorded at the level of URL category ("frontpage", "news", "tech", "local", "opinion", "on-air", "misc", "weather", "health", "living",

"business", "sports", "summary", "bbs" (bulletin board service), "travel", "msn-news", and "msn-sports") and are recorded in time order. We have utilized this real dataset with 1000 records of 10 transactions.

### 1.5.6. Performance Analysis

The experiment results of the proposed algorithm for mining of fuzzy sequential patterns from progressive database using lattice structure are described in this section. It is compared with the negative fuzzy sequential pattern mining approach proposed by Lin N.P *et al.* (2007c*)*. The experiment results show the advantageous feature of single scan due to lattice structure in terms of computational time. The performance of the Progreslattice Miner (PLM) is evaluated by means of three standard evaluation metrics, a) generated number of fuzzy sequential patterns b) computational time and c) memory usage.

#### 1.5.6.1. Effect of support values

Here, the performance analysis of our proposed fuzzy sequential pattern mining approach is depicted with the aid of the synthetic dataset and the real dataset by showing the results with the effects of diverse support values. The result analysis is plotted as a graph by computing the generated number of sequences, computational time and the memory usage with different minimum support threshold.

The number of fuzzy sequences generated for various support thresholds for both synthetic and real dataset is shown in Figure 1.12. By analyzing the graphs, we conclude that the performance study of our proposed approach shows better performance with the existing tested Lin N. et al.'s approach. In this, the number of frequent fuzzy sequences grows up exponentially for synthetic database, when the support threshold is low. The proposed algorithm performs fairly well in all the support values with minimum number of fuzzy sequences of frequent sequences for real dataset. The running time for the mining of sequences are shown in Figure 1.13 for two databases. However, when there are a large number of frequent sequences, the run time performance of both the approaches is on higher end. The computational time decrease with increasing support values for synthetic database and remain nearly constant for real database. The PLM algorithm proves well in the memory usage than the existing algorithm for synthetic database but consume a huge amount of memory for real database as given in Figure 1.14.

#### 1.5.6.2 Effect of scalability

Here, the performance analysis of our proposed fuzzy sequential pattern mining approach is depicted by computing the generated number of sequences, computational time and the memory usage with different number of records in order to prove the scalability of the proposed one. The number of fuzzy sequences generated for different number of records is shown in Figure 1.15 for synthetic and real datasets. By analyzing the graphs, the number of fuzzy sequences generated is far less than the Lin N. et al.'s approach in both cases. Similarly, the runtime and the memory usage for the mining of sequences are shown in Figure 1.16 and 1.17 respectively. The ProgresLattice Miner algorithm performs very well in terms of computational time with varying number of records for both synthetic and real datasets given in Figure 1.16. However, the memory usage of the algorithm is high as compared to Lin P. *et al*.'s approach with the various numbers of records in case of real datasets. This

is though comparable in case of synthetic database as given in Figure 1.17.

Experiments have highlighted that this study could be applied to different kinds of data and build many standpoints. The experiments are carried out using different synthetic and real life datasets to prove the efficiency of the proposed algorithm. The obtained results showed that the proposed algorithm is better than Lin *et al*.'s approach in terms of generated number of fuzzy sequences and computational time with varying number of fuzzy support values and records of the datasets. However, the improved memory utilization for the algorithm can be taken as a future work.

**1.6. Conclusion**

The non-numeric information provides truly useful results from user perspective. In recent times, there is need for methods that help the user to process, retrieve, exploit and clarify the available knowledge in a simple way. Here, the fuzzy set theory comes to an aid. There can be a compromise in terms of correctness, completeness and efficiency of extracted information using this technique, but they provide simple and understandable results. Fuzzy sequential mining is used to get knowledge regarding order of the mining results. The sequential mined results need to be represented and maintained with timestamp. This can be done efficiently using the lattice-theoretic framework. The closure and certain properties of lattice model helps in making it a good option to represent the fuzzy data. The lattice can be represented using the undirected graph to get the fuzzy sequential patterns and consequently useful knowledge for business applications and otherwise. The use of lattice representation avoids scanning of the database for mining patterns. The entire database is scanned once to build the lattice structure which is an intermediate data structure in the memory. This reduces the computational time where the complexity of lattice representation in not an issue. This is a temporary data structure generated by the algorithm for its own further use for sequential pattern mining. The only disadvantage it offers here is the more memory usage; however overcoming it is suggested as future work.

In this chapter, an efficient algorithm for incremental mining of fuzzy sequential patterns from progressive database is proposed. This allows the extraction of frequent fuzzy sequences based on minimum support threshold as well as the fuzzy lattice support. This algorithm can be used for incorporating fuzziness in the incremental mining of sequential patterns; however incorporation of constraints to this can be taken as future work.

**References**

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*2. Aggarwal, Gargi, and Bhatia, M. P. S., 2012. A Novel Faster Approximate Fuzzy Clustering Approach with Highly Accurate Results. International Conference on Contemporary Computing, 2012, India, August 6-8, 2012. Proceedings in Communications in Computer and Information Science, 309, Springer 2012, ISBN 978-3-642-32128-3, pp: 213-224.*

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*5. Ahmed, D.M., Sundaram, D., and Piramuthu, S., 2010. Knowledge-based Scenario Management – Process and Support. Decision Support Systems, 49(4), pp: 507-520.*

# Tables

| Sequence Identifier | Sequences |
|---|---|
| S100 | < PC (Windows Media Player, Video Card, Sound Card)( Barcode reader, Printer) Quick Heal (Loudspeaker, CD-ROM)> |
| S200 | <(PC, Windows 7) Adobe Reader (Logical Disk Manager, Oracle) (Digital Camera, Microphones)> |
| S300 | <(PC, OS/2.1x) (Adobe Flash Player, Sound Card) (Windows Media Player, Video Card) JExpress,Printer > |
| S400 | < PC, Network Card (Windows Media Player, Video Card) McAfee Internet Security, Acronis Disk Director, LHMelt > |

**Table 1.1 Progressive Database 'PD3'**

| Sequence Identifier | Hardware | Software | Accessories |
|---|---|---|---|
| S100 | 4 | 2 | 3 |
| S200 | 1 | 4 | 4 |
| S300 | 3 | 4 | 1 |
| S400 | 3 | 4 | 0 |

**Table 1.2 Parsing results of Progressive Database 'PD3'**

| Sequence Identifier | Hardware= quantity | | | Software= number | | | Accessories | | |
|---|---|---|---|---|---|---|---|---|---|
| | small | few | high | low | medium | large | small | few | high |
| S100 | | | 1 | 1 | | | | 0.5 | 0.5 |
| S200 | 1 | | | | 1 | | | | 1 |
| S300 | | 0.5 | 0.5 | | 1 | | 1 | | |
| S400 | | 0.5 | 0.5 | | 1 | | 1 | | |

**Table 1.3 Membership degree of customer sequences for fuzzy sets**

| Customer id | Purchase sequences | | | | | | |
|---|---|---|---|---|---|---|---|
| | T2 | T4 | T6 | T8 | T9 | T10 | T11 |
| 01 | | b | cd | | a | | |
| 02 | c | b | | d | | e | a |
| 03 | | a | e | | b | c | |
| 04 | a | d | | | da | | |
| 05 | c | b | | d | | ac | |
| 06 | | a | | | d | c | |
| 07 | b | | c | | | | d |

**Table 1.4 Customer transactions from Progressive database**

# Tables

| Customer id | Fuzzy sets: (L: low; M: medium; H: high) | | | | | | |
|---|---|---|---|---|---|---|---|
| | T2 | T4 | T6 | T8 | T9 | T10 | T11 |
| 01 | | (0.7/b.L+ 0.3/b.M) | (0.7/cd.M + 0.3/cd.H) | | 0.9/a.H | | |
| 02 | (0.6/ c.L) | (0.7/b.L+ 0.3/b.M) | | (0.1/d. M +0.9/d. H) | | 0.6/e.H | 0.3/a.H |
| 03 | | (0.7/a.L+ 0.3/a.M) | (0.7/e.M +0.3/e.H) | | 0.9/b.H | 0.6/c.H | |
| 04 | (0.6/a.L) | (0.7/d.L+ 0.3/d.M) | | | 0.9/da.H | | |
| 05 | (0.6/c.L) | (0.7/b.L+ 0.3/b.M) | | (0.1/d. M +0.9/d. H) | | 0.6/ac.H | |
| 06 | | (0.7/a.L+ 0.3/a.M) | | | 0.9/d.H | 0.6/c.H | |
| 07 | (0.6/b.L) | | (0.7/c.M +0.3/c.H) | | | | 0.3/d.H |

**Table 1.5 Fuzzy sequences transformed from progressive database**

| | |
|---|---|
| 2-length sequences | (c, b : L), (b, d : M), (d, a : H) |
| 1-length sequences | (c : L), (b : L), (a : L), (d : M), (e:H), (c : H), (a : H), (d : H) |

**Table 1.6 Mined frequent fuzzy sequential patterns from incremental database**

| | |
|---|---|
| 2-length sequences | (b, d : M), (d, a : H) |
| 1-length sequences | (b : L), (d : M), (e: H), (c : H), (a :H), (d : H) |

**Table 1.7 Mined frequent fuzzy sequential patterns from progressive database**

# Figures

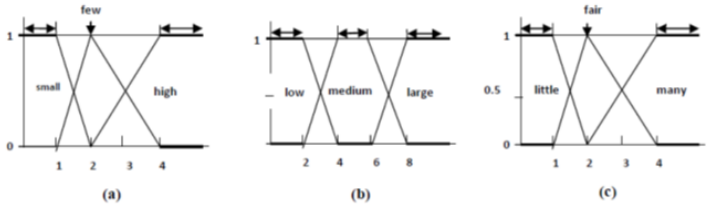


**Figure 1.1 Fuzzy sets for hardware, software and accessories itemsets**

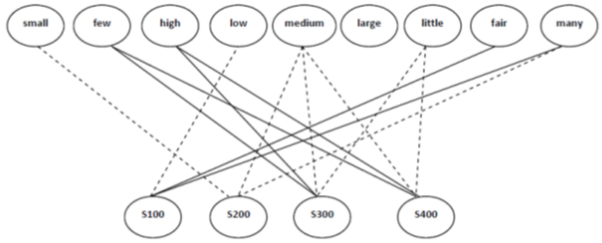


**Figure 1.2 Graph summarizing the sequences with the fuzzy sets**

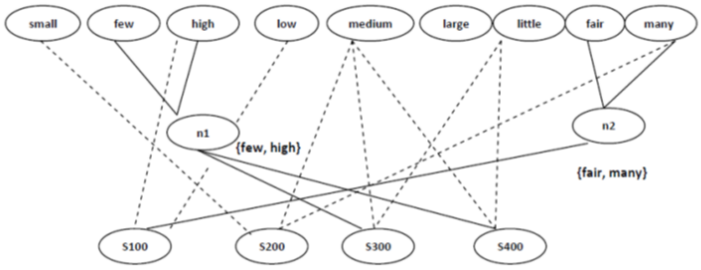


**Figure 1.3 Lattice structure summarizing the sequences with fuzzy sets**

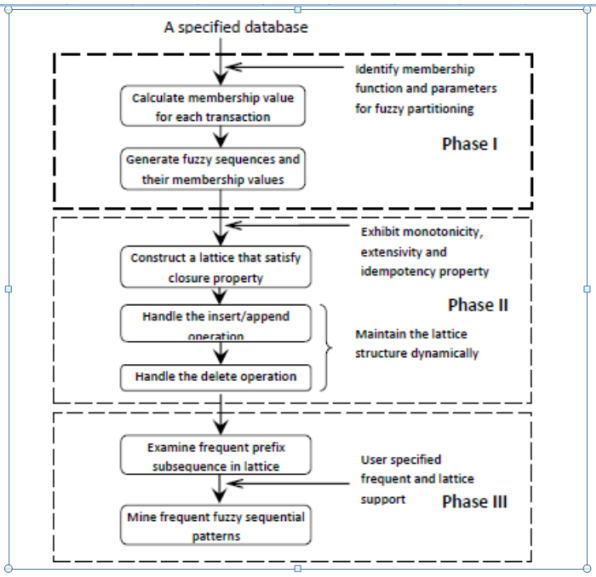


**Figure 1.4 Model for Progres Lattice Miner Algorithm**

# Figures

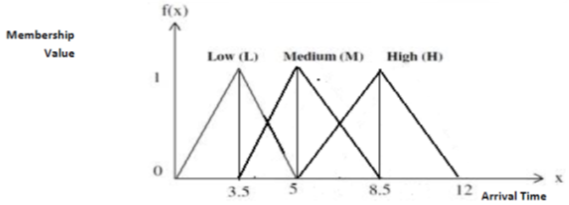


**Figure 1.7 Triangular membership functions with defined parameter values**

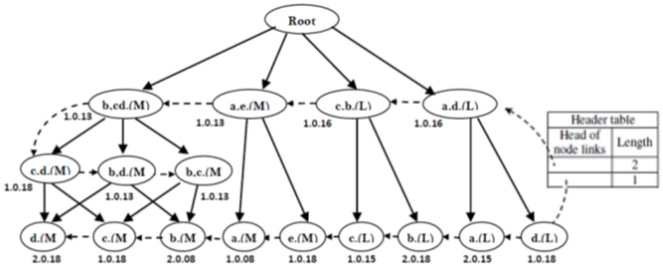


**Figure 1.8 Lattice structure for the sequences of T2 to T6 of Table 1.5**

# Figures


**Figure 1.9 Complete lattice structures with updating in the existing customer**

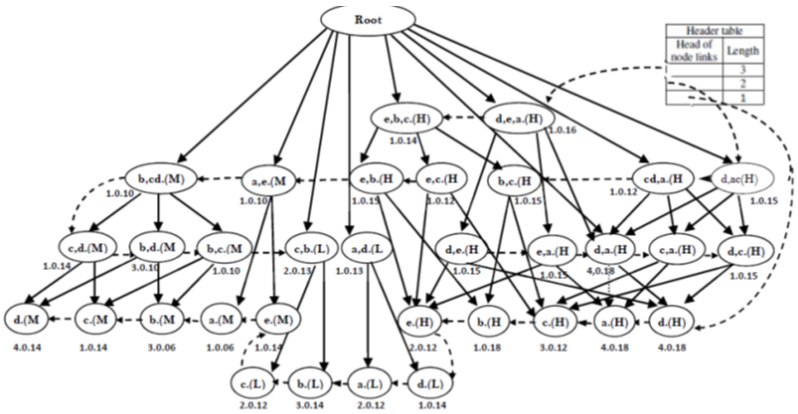


**Figure 1.10 Complete lattice structure with updating of new customer sequences**

$$f(x) = \begin{cases} 0 & if\ x \le a \\ \dfrac{x-a}{b-a} & if\ a \le x \le b \\ \dfrac{c-x}{c-b} & if\ b \le x \le c \\ 0 & if\ x \ge c \end{cases}$$

**Figure 1.5 Formula f(x) to compute triangular membership function**

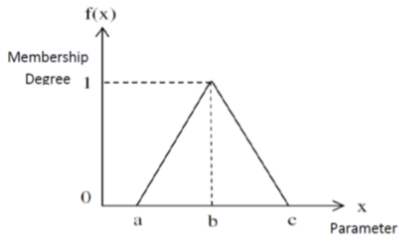


**Figure 1.6 Triangular Membership Function**

# Figures

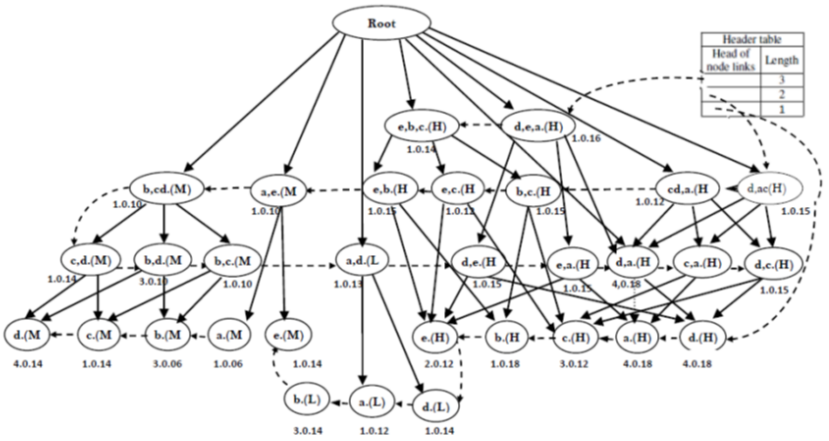


**Figure 1.11 Complete ProgresLattice structure with deletion operation in database**

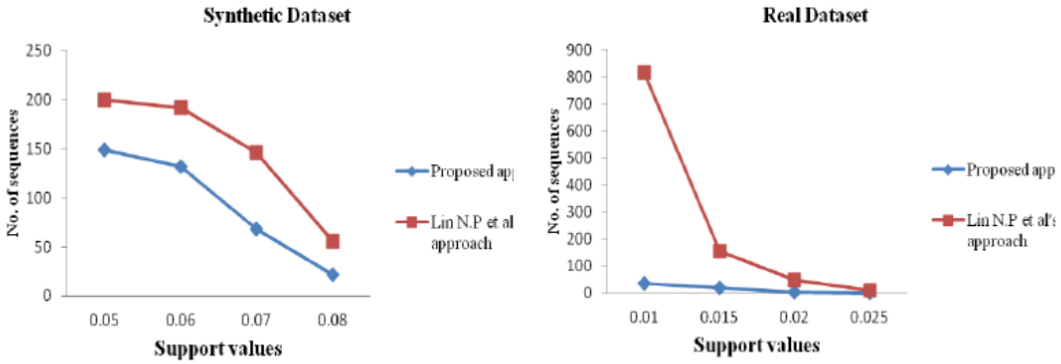


**Figure 1.12 Number of sequences generated by ProgresLattice-Miner and Lin N.P. et al's with different support values for real and synthetic databases.**

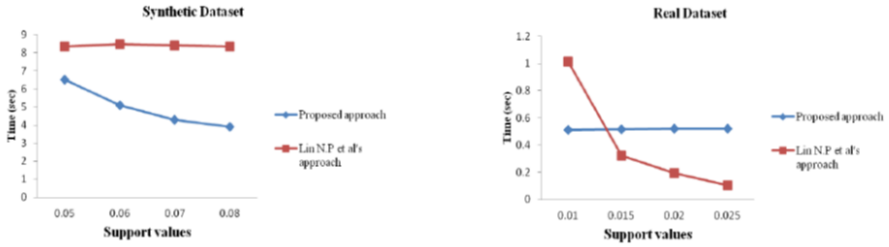


**Figure 1.13 Computation time for ProgresLattice-Miner and Lin N.P. et al's with different support values for real and synthetic databases.**

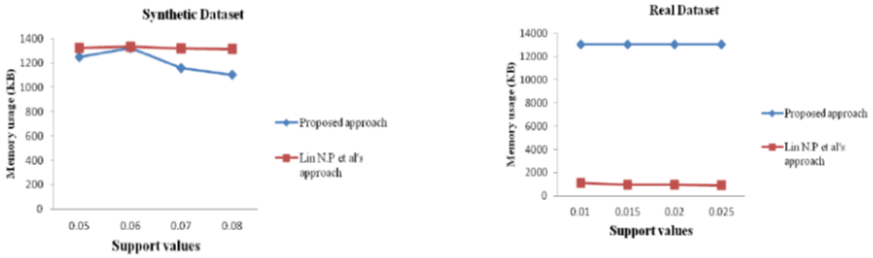


**Figure 1.14 Memory usage of ProgresLattice-Miner and Lin N.P. et al's with different support values for real and synthetic databases.**

# Figures

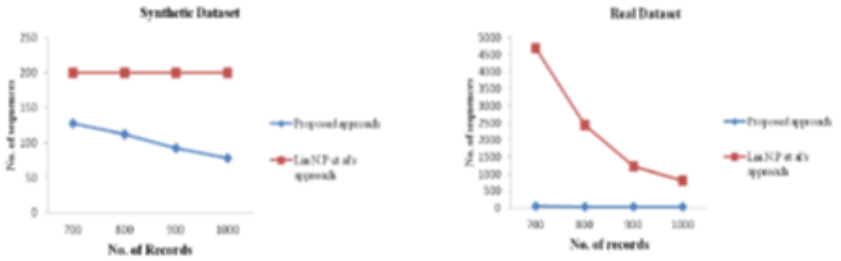


**Figure 1.15 Number of sequences generated for ProgresLattice Miner and Lin N. P. et al's with different number of records of real and synthetic databases.**

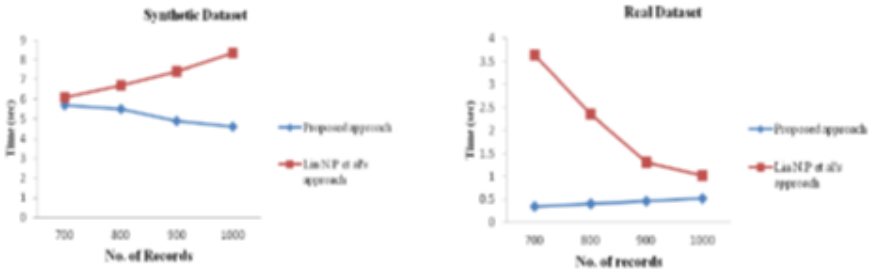


**Figure 1.16 Computation time for ProgresLattice Miner and Lin N P et al's with different number of records of real and synthetic databases.**

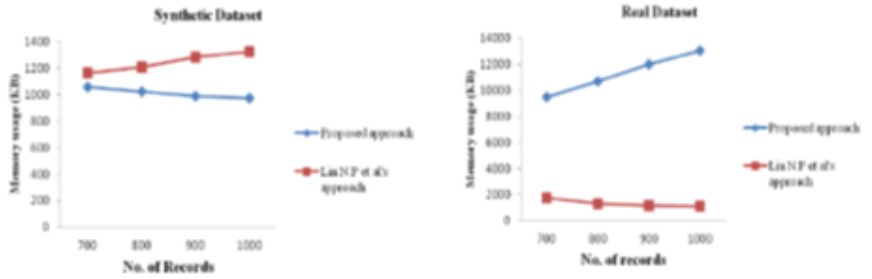


**Figure 1.17 Memory usage for ProgresLattice Miner and Lin N P et al's with different number of records of real and synthetic databases.**

# NGCMDT: Next Generation Cyber Malware Detection and Prevention Technology

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**Abstract**

*Fifty years ago, no one would have imagined that one of the biggest threats in today's society would be cybercrime, but the frequency and universal nature of cyber attacks are proving otherwise. The threat has become so prolific in fact that long-standing television crime show CSI (Crime Scene Investigation) created a fourth series, CSI: Cyber solely focused on attacks that occur in cyber space.*

*Malware, hackers, cybercrime and online attacks are all terms with which we have become accustomed over the last two decades, just as we now recognize the names of security brands. However, although numerous technology companies offer a range of internet security solutions to combat these issues, cyber criminals continue to invent new ways to attack. As technology continues to evolve, so do the abilities of hackers to sneak through firewalls, log in to systems and create chaos.*

*Malware may be stealthy, intended to steal information or spy on computer users for an extended period without their knowledge, as for example Reign, or it may be designed to cause harm, often as sabotage (e.g., Stuxnet), or to extort payment (Crypto Locker). 'Malware' is an umbrella term used to refer to a variety of forms of hostile or intrusive software, including computer viruses, worms, trojanhorses,ransomware, spyware, adware, scareware, and other malicious programs. It can take the form of executable code, scripts, active content, and other software. Malware is often disguised as, or embedded in, non-malicious files.*

*Spyware or other malware is sometimes found embedded in programs supplied officially by companies, e.g., downloadable from websites, that appear useful or attractive, but may have, for example, additional hidden tracking functionality that gathers marketing statistics. An example of such software, which was described as illegitimate, is the Sony rootkit, a Trojan embedded into CDs sold by Sony, which silently installed and concealed itself on purchasers' computers with the intention of preventing illicit copying; it also reported on users' listening habits, and unintentionally created vulnerabilities that were exploited by unrelated malware.[8]*

## Introduction

**Tripwire** Enterprise is a real-time endpoint threat protection solution that continuously captures, monitors and records system and file change data on a broad range of enterprise servers and endpoint platforms. Palo Alto Networks **WildFire** automatically detects new, unknown threats through dynamic analysis in a cloud-

based virtual environment. Tripwire Enterprise then initiates workflow actions for remediation if the file is tagged as malware. Together, the two offerings significantly reduce the time to accurately detect, prioritize and respond to advanced threats from the network edge to endpoint systems before they compromise organizations.

The challenge of protecting enterprise networks against rapidly evolving malware and zero-day exploits that target critical enterprise systems is growing increasingly difficult. Advanced persistent threat (APT) attacks often hide in plain sight, using common applications to penetrate exterior defenses, and once inside a network, they act like day-to-day traffic while stealing targeted data.

**Detection of Cyber Security (Malware)**

Cyber Security is difficult to detect and remove. Cyber Security is not likely to be removed through a convenient "uninstall" feature. Cyber Security, as well as other spyware, can re-install itself even after it appears to have been removed.

You also run the risk of damaging your computer since you're required to find and delete sensitive files in your system such as DLL files and registry keys. It is recommended you use a good spyware remover to remove Cyber Security and other spyware, adware, Trojans and viruses on your computer.

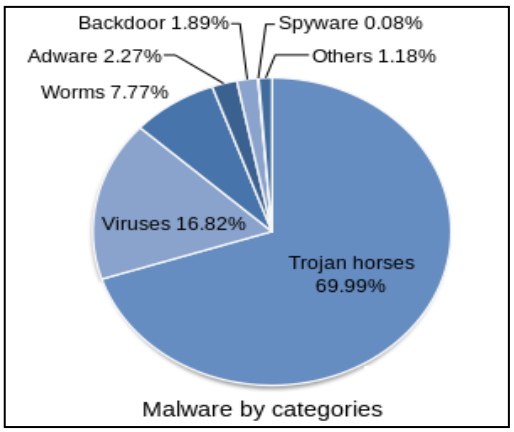
**Run a Cyber Security scan/check** to successfully detect all Cyber Security files with the SpyHunter Spyware Detection Tool. If you wish to remove Cyber Security, you can either purchase the SpyHunter spyware removal tool to remove Cyber Security or follow the Cyber Security manual removal method provided in the "Remedies and Prevention" section.

**Method of Infection**

There are many ways your computer could get infected with Cyber Security. Cyber Malware can come bundled with shareware or other downloadable software.

Another method of distributing Cyber Security involves tricking you by displaying deceptive pop-up ads that may appear as regular Windows notifications with links which look like buttons reading Yes and No. No matter which "button" that you click on, a download starts, installing Cyber Security on your system. Cyber Security installs on your computer through a Trojan and may infect your system without your knowledge or consent.

**Malware Category and their Percentage**



**Traditional Techniques to Remove Cyber Security or Malware (Manually)**

To remove Cyber Security is to manually delete Cyber Security files in your system. Detect and remove the following Cyber Security files:

**Processes**

csc.exe

cs.exe

tsc.exe

**DLLs**

winsource.dll

**Other Files**

Help.lnk

Registration.lnk

Cyber Security.lnk

%ProgramFiles%\CSec

**Registry Keys**

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Cyber Security

HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run "1FD92E3F7C34799BFB075C41DA05D1FE"

**Wildfire: Automatically Detect and Prevent Unknown Threats**

WildFire **cloud-based malware analysis environment** offers a completely new approach to cybersecurity. Through native integration with Palo Alto Networks Enterprise Security Platform, the service brings advanced threat detection and prevention to every security platform deployed throughout the network, automatically sharing protections with all WildFire subscribers globally in about 15 minutes.

**The service offers:**

Unified, hybrid cloud architecture deployed via either the public cloud, a private cloud appliance that maintains all data on the local network, or a combination of the two.

Dynamic analysis of suspicious content in a cloud-based virtual environment to discover unknown threats.

Automatic creation and enforcement of best-in-class, content-based malware protections.

Link detection in email, proactively blocking access to malicious websites.

Advanced attacks are not point-in-time events. Adversaries deliver attacks persistently, often using non-standard ports, protocols or encryption for subsequent attack stages. Like Palo Alto Networks Next-Generation Firewall, WildFire provides complete visibility into unknown threats within all traffic across thousands of applications, including Web traffic, email protocols (SMTP, IMAP, POP), and FTP, regardless of ports or encryption (SSL).

WildFire simplifies an organization's response to the most dangerous threats, automatically detecting unknown malware and quickly preventing threats before an enterprise is compromised. Unlike legacy security solutions, WildFire quickly identifies and stops these advanced attacks without requiring manual human intervention or costly Incident Response (IR) services

after the fact.

**Turn the Power of the Cloud against Unknown Threats**

WildFire has a unified public/private cloud-based architecture that maximizes the sharing of threat intelligence while minimizing hardware requirements. The architecture allows the service to be deployed from any Palo Alto Networks security platform, with no additional hardware, or as a private cloud option (WF-500 appliance), where all analysis and data remain on the local network. Whether deployed as a public or private cloud, or a hybrid of the two, the WildFire analysis environment is shared across all security platforms on a customer's network, as opposed to deploying single-use sandboxing hardware at every ingress/egress point and network point of presence. WildFire can also detect unknown malware pervasively throughout the network. Any location where a Palo Alto Networks security platform is deployed now becomes a point of malware detection and prevention, including:

Internet edge (next-generation firewall platforms)

Data center edge (PA-7050)

Between virtual machines (VMs) in the data center (VM-Series)

Mobile devices and endpoints (Global Protect and Traps)

**Automatically Protect Users and Stop Compromise**

The first step is to detect unknown threats, but next you must automatically close the loop to prevent them from reaching the network. Once WildFire discovers a new threat, the service automatically generates protections across the attack lifecycle, blocking malicious files and command-and-control traffic. Uniquely, these protections are content-based, not relying on easily changed attributes such as hash, filename or URL, allowing the service to block the initial malware and future variants without any additional action or analysis. WildFire informs the protection of other Palo Alto Networks security services, blocking threats in-line through:

Threat Prevention (anti-malware, DNS, command-and-control)

Web Security (malicious URLs in PAN-DB)

Global Protect (anti-malware for mobile devices)

**Conclusion**

Traditional methods of security have become obsolete as technology evolves and the business environment changes. A multiplicity of new security risks rear their ugly heads when organizations engage with technology innovations; entering the cloud, allowing employees to use mobile devices, and connecting with more suppliers in various locations. This evolving business climate extends the difficulty in assessing an organization's exposure to the global cyber threat landscape.

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3. *www.wikipedia.org/wiki/Malware*
4. *www.paloaltonetworks.com/products/technologies/wildfire.html*

# Static Analysis of Scala Programs in a Rule Based Framework

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## Abstract

*This paper describes a practical Scala program analysis framework obtained by combining an extended verification toolbox. In our methodology, rules are used to specify complex inter-procedural program analyses involving dynamically created objects. After extracting an initial set of information about Scala program semantics from the program Bytecode, our framework transforms the rules of a particular analysis into a Boolean Equation System (BES), whose local resolution corresponds to the demand-driven computation of program analysis results.*

## Introduction

Static program analysis extracts program semantics information from code, without running it. An example of such an analysis to study the data-flow dependencies of a program is the definition-use analysis. An abstract representation of the program containing the variable definitions and uses at each program statement is built, on which the analysis is solved.

In this paper, we focus on static reference analyses of Scala programs and generally speaking, of any object-oriented programming languages, which are characterized by data abstraction, inheritance, polymorphism, dynamic binding of method calls, dynamic loading of classes, and querying of program semantics at runtime through reflection. A reference analysis, also called points-to analysis, determines information about the set of objects to which a reference variable or field may point during program execution. There is a real interest in using such an analysis in program understanding tools (e.g. semantics browsers or program slicers), in software maintenance tools and also in testing tools using coverage metrics.

Recently, various rule-based specifications for a large number of program analyses have been developed using a simple relational query language, called Datalog. This language, based on declarative rules to both describe and query a deductive database, is rich enough to describe complex inter procedural program analyses involving dynamically created objects. This paper presents a fully automatic and efficient demand-driven evaluation framework for Datalog queries, based on a

local Boolean equation system (BES) resolution. The system, called Datalog Solve,has been developed within the Cadp verification toolbox and connected to the Joeq virtual machine in order to detect errors, like non-satisfaction of the query, in Java programs at compile time.

**Datalog specification of a program analysis**

The Datalog approach to static program analysis can be summarized as follows. Each program element, namely variables, types, code locations, function names, are grouped in their respective domains. By considering only finite program domains, Datalog programs are ensured to be safe (query evaluation generates a finite set of facts). Each program statement is decomposed into basic program operations, namely load, store, assignment, and variable declarations. Each kind of basic operation is described by a relation in a Datalog program. A program operation is then described as a tuple satisfying the corresponding relation. In this framework, a program analysis consists in either querying extracted relations or computing new relations from existing ones.

```
### Domains
V     262144    variable.map
H     65536     heap.map
F     16384     field.map
### Relations
vP_0          (variable : V, heap : H)
              inputtuples
store         (base : V, field : F,
source : V)   inputtuples
load          (base : V, field : F, dest :
V)    inputtuples
assign (dest : V, source : V)        in-
puttuples
vP            (variable : V, heap : H)
              outputtuples
hP            (base : H, field : F, target :
H)    outputtuples
### Rules
vP (v, h)              :-    vP_0 (v, h).
vP (v1 , h)            :-    assign(v1 ,
v2), vP (v2 , h).
hP (h1 , f, h2)  :-   store(v1 , f,v2), vP
(v1,h1),vP(v2 , h2).
vP (v2 ,h2)            :-    load (v1,
f,v2),vP(v1, h1),hP (h1,f,h2)
```

**Listing 4.1 Datalog specification of a context-insensitive points-to analysis**

**Example 4.1** Consider the Datalog program that defines context-insensitive points-to analysis (pa.datalog ) given in Fig. 4.1. The program consists of three parts:

(i) A declaration of domains where domain names and sizes (number of elements) are

specified.

(ii) A list of relations, i.e., atoms, specified by a predicate symbol, its arguments over specific domains and whether it is derived from an applicable Datalog rule (value outputtuples), or extracted from the program Bytecode (value inputtuples).

(iii) A finite set of Datalog rules, defining the outputtuples relations.

The example of Datalog program analysis given in Fig. 4.1 consists in inferring possible points-to relations from local variables and method parameters in domain V to heap objects in domain H as well as possible points-to relations between heap objects through field identifiers in domain F. Datalog constraints are declared as sets of tuples, i.e., inputtuples relations.

For example, the relation vP 0 consists of initial points-to relations (v, h) of a program, i.e., vP 0 (v,h) is true if there exists a direct assignment within the program between a reference to a heap object h ∈ H and a variable v ∈ V (e.g., v = new String() statements in Scala). Other Datalog constraints such as store, load and assign relations are calculated similarly. Each Datalog rule then models the effect of one of these input relations over the heap.

Finally, a Datalog query consists of a set of goals over the relations defined in the Datalog program, e.g., :- vP(x,y). where x and y are variable arguments of vP. This goal aims at computing the complete set of variables x that may point to any heap object y at any point during program execution.

**BES EVALUATION OF A DATALOG QUERY**

Our Datalog query evaluation framework (see Fig. 4.2), called Datalog Solve, takes three inputs: a domain definition (file .map), a set of Datalog constraints (i.e.,a set of facts, file .tuples), and a Datalog query q = hG,Ri (file .datalog), where R is a Datalog program (a finite set of Datalog rules), and G is the set of goals (Datalog rules with empty head). The domain definition states the possible values for each predicate's argument in the query. Datalog constraints represent the program information relevant for the analysis. Both, domain definitions facts are automatically extracted from program Bytecode by the Joeq compiler. As in, we assume that Datalog programs have stratified negation (no recursion through negation), and totally-ordered finite domains, without considering comparison operators.

Our Datalog Solve system (120 lines of Lex,

380 lines of Bison and 3 500 lines of C code) proceeds in two steps: 1) translation of the Datalog query to Bes, 2) generation and interpretation of the solutions to the query.

**Example 3.2** Consider the Datalog program given in Fig. 4.1 that defines context-insensitive points-to analysis (pa.datalog). The Bes transformation of the Datalog-based program analysis for the goals vP(x, y) and hP(z1,w, z2) consists in the following equation system:

$x_0 \overset{\mu}{=} vP(x, y) \vee hP(z1,w, z2)$

$vP(v : V, h : H) \overset{\mu}{=} vP\_0(v, h) \vee (assign(v, v2) \wedge vP(v2, h)) \vee (load(v1, f, v) \wedge vP(v1, h1) \wedge hP(h1, f, h))$

$hP(h1 : H, f : F, h2 : H) \overset{\mu}{=} store(v1, f, v2) \wedge vP(v1, h1) \wedge vP(v2, h2)$

Boolean variable x0 encodes the set of Datalog goals whereas parameterised) boolean variables vP(v : V, h : H) and hP(h1 : H, f : F, h2 : H) represent the set of Datalog rules in the program.

The back-end of our system carries out the demand-driven generation, resolution and interpretation of the Bes by means of the generic Caesar Solve library of Cadp, devised for local Bes resolution and diagnostic generation.

The tool takes as a default query the computation of the least set of facts that contains all the facts that can be inferred using the rules defining the program analysis. This represents the worst case of a demand-driven evaluation, where all the information derivable from a Datalog program is computed.

**Experimental Results**

The Datalog Solve framework was applied to a number of Java programs by computing the context-insensitive pointer analysis described in Fig. 4.1.

To test the scalability and applicability of the transformation, we applied our technique to 4 of the most popular 100% Scala projects on Sourceforge that could compile directly as standalone applications. These projects were also used as benchmarks by the Bddbddb system, one of the most efficient deductive database engine, based on binary decision diagrams (Bdds), that scales to large Scala programs. The benchmarks are all real applications with tens of thousands of users each. Projects vary in the number of classes, methods, bytecodes, variables, and heap allocations. The information details, shown on Table 4.1, are calculated on the basis of a context-insensitive callgraph precomputed by the Joeq compiler.

All experiments were conducted using Scala 2.0, on a Intel Core 2 Duo 1.66GHz with 2 Gigabytes of RAM, running Linux Kubuntu 9.01. The analysis times and memory usages of our context insensitive pointer analysis, shown on Table 4.2, illustrate the scalability of our Bes resolution on real examples. Datalog Solve solves the (default) query for all benchmarks in a few seconds.

The analysis results were verified by comparing them with the solutions computed by the Bddbddb system on the same benchmark of Java programs and analysis.

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## Tables

**Table 4-1:Description of the Scala projects used as benchmarks.**

| Name | Description | Classes | Methods | Bytecodes | Vars | Allocs |
|---|---|---|---|---|---|---|
| sfreets | speech synthesis system | 215 | 723 | 46K | 8K | 3K |
| snfcchat | scalable distributed chat client | 283 | 993 | 61K | 11K | 3K |
| setty | server and servlet container | 309 | 1160 | 66K | 12K | 3K |
| soone | Scala neural net framework | 375 | 1531 | 92K | 17K | 4K |

**Table 4-2: Times (in seconds) and peak memory usages (in megabytes) for each benchmark and context-insensitive pointer analysis.**

| Name | Time (sec.) | Memory (Mb.) |
|---|---|---|
| sfreets | 10 | 61 |
| snfcchat | 8 | 59 |
| setty | 73 | 70 |
| soone | 4 | 58 |

## Figure

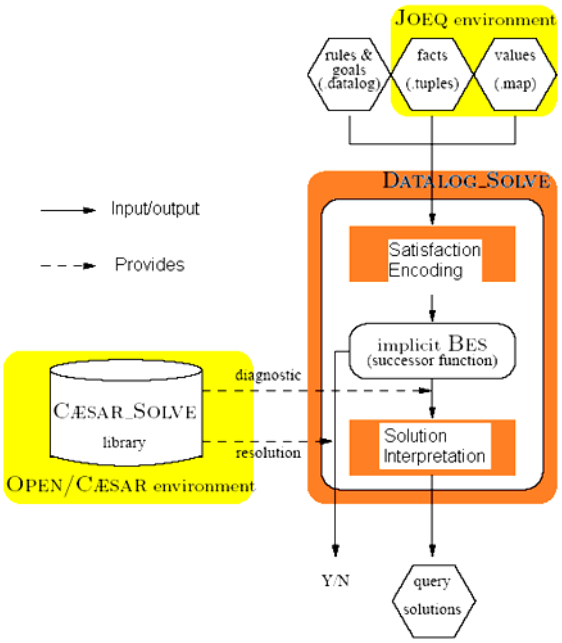


Figure 4.1: Scala program analysis using Datalog Solve framework

# साहित्य में आदर्श : स्वरूप एवं विश्लेषण

डॉ0 श्रीमती जस्सी जोस
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**सारांश–**

*आदर्शवाद का ध्येय पृथ्वी को स्वर्ग बनाना, शोषण–रहित समाज स्थापना के लिए प्रयत्न करना और संसार को सब प्रकार के दोषों से मुक्त करना है; आदर्शवाद असत्य पर सत्य की, अंधकार पर प्रकाश की, अज्ञान पर ज्ञान की, विजय दिलाता है। अतः कहीं–कहीं कोरी कल्पना बनकर भी रह जाता है। आदर्शवाद का ध्यान हमेशा भविष्य पर रहता है। वह मानव–जीवन की आंतरिक विवेचना करता है। वह मानवीय जीवन के हितकर, कल्याणकारी तथा उदात्त मूल्यों को ग्रहण करता है। आदर्शवाद का संबंध सत्, उदात्तता, धर्म और नैतिकता के साथ रहता है।*

**आदर्श –: अर्थ एवं परिभाषा**

आदर्शवादी प्रवृत्ति साहित्य की सबसे प्राचीन प्रवृत्ति है। साहित्य की यह प्रवृत्ति साहित्य के सामाजिक लोक–मंगल के प्रयोजन पर आधारित प्रवृत्ति है। जिसमें व्यक्ति के जीवन की समस्याओं का चित्रण व्यक्ति में किसी व्यापक सामाजिक आदर्श की प्रतिष्ठा के निमित्त किया जाता है। वह आदर्श बहुधा प्राचीन परम्परा का आदर्श होता है। आदर्शवादी प्रवृत्ति के साहित्य में व्यक्ति का आदर्श पूर्व निर्धारित आदर्श होता है, जो पात्र के माध्यम से किसी व्यापक सामाजिक आदर्श की स्थापना करता है। वह आदर्श व्यक्ति के जीवन की विषम परिस्थितियों कि घ ाात–प्रतिघात में उसके चरित्र के 'कु' और 'सु' के उतार–चढ़ाव और संघर्ष का स्वाभाविक प्रतिफल न होकर व्यक्ति के चरित्र का स्थापित गुण होता है, जिसके बल पर वह जीवन की समस्त विषमताओं से संघर्ष करता हुआ अडिग बना रहता है या साहित्यकार किसी सामाजिक आदर्श की स्थापना के लिए पात्रों और घटनाओं के संघर्ष का संगठन करता है। इस प्रकार के चित्रण में पात्रों और घटनाओं का अधि ाकांशतः सपाट, सीधा और सरल–चित्रण होता है। इस काल में धीरे–धीरे आदर्शवादी चित्रण की प्रवृत्ति कम होती जा रही है; क्योंकि वह व्यक्ति के चरित्र की जटिलताओं तथा परिस्थितियों की उलझन में उसके मनोभावों की उलझनों का स्वाभाविक चित्रण नहीं कर पाती। इसकी अपेक्षा यथार्थवादी चित्रण की प्रवृत्ति बल पकड़ती जा रही है। साहित्य समाज का दर्पण होता है क्योंकि समाज में आदर्शों का नीतियों का अत्यन्त अवमूल्यन हुआ है अतः अब साहित्य में आदर्श का चित्रण कम देखने को मिलता है।

आदर्श का रूप देशकाल सापेक्ष होता है। परिस्थितियों के कारण आदर्शों के रूप में भी परिवर्तन होता रहता है। पर आदर्श के साथ एक शर्त सर्वत्र लगी रहती है– वह हमारे वर्तमान जीवन को गति और तीव्रता नहीं दे सकता वह निर्जीव होगा। कहीं आदर्श जड़ न हो जाए, इसीलिए उसमें परिस्थितियों के अनुसार परिवर्तन करते रहना चाहिए।

आदर्शवाद की नींव धर्म और आचार पर आध ाारित है। धर्म की मान्यताओं तथा नियमों का यथावत पालन आदर्शवाद की विशेषता है। नीति और आदर्शवादिता, आदर्शवाद को जन्म देती है।

**पं0 नंद दुलारे बाजपेयी के अनुसार**,

''आदर्शवाद अनेकता में एकता देखने का प्रयास करता है। वह विश्रृंखलता में श्रृंखला, निराशा में आशा, दुःख में समाधान की प्रतिष्ठा करने का उद्देश्य रखता है।''

**प्रेमचन्द्र जी** के शब्दों में, ''वह (आदर्शवाद) हमें ऐसे चरित्रों से परिचय कराता है, जिनके हृदय पवित्र होते हैं, जो यथार्थ वासना से रहित होते हैं, साध J प्रकृति के होते हैं।''

**कोशाकार के अनुसार**, ''आदर्शवादी वह है, जो उच्च नैतिक, आध्यात्मिक और सौंदर्यपरक प्रतिम. ानों–आदर्शों को स्वीकार करके अपने तथा समाज के जीवन को उनके अनुसार ढालने का प्रयास करे।

उक्त परिभाषाओं से यह स्पष्ट हो जाता है कि आदर्शवाद का ध्येय पृथ्वी को स्वर्ग बनाना, शोषण–रहित समाज स्थापना के लिए प्रयत्न करना और संसार को सब प्रकार के दोषों से मुक्त करना है ; आदर्शवाद असत्य पर सत्य की, अंधकार पर प्रकाश की, अज्ञान पर ज्ञान की, विजय दिलाता है। अतः कहीं–कहीं कोरी कल्पना बनकर भी रह जाता है। आदर्शवाद का ध्यान हमेशा भविष्य पर रहता है। वह मानव–जीवन की आंतरिक विवेचना करता है। वह मानवीय जीवन के हितकर, कल्याणकारी तथा उदात्त मूल्यों को ग्रहण करता है। आदर्शवाद का संबंध सत्, उदात्तता, धर्म और नैतिकता के साथ रहता है।

आदर्शवाद एक दार्शनिक सिद्धांत के रूप में वस्तु की अपेक्षा व्यक्ति को, उसके विचारों, भावनाओं तथा आदर्शों को महत्व देता है। आदर्शवाद में प्रकृति के स्थान पर मानव तथा उसके व्यक्तित्व के विकास तथा आध्यात्मिक विकास के लक्ष्य को महत्वपूर्ण समझा जाता है तथा उसके माध्यम से ईश्वर का ज्ञान कराये जाने की भावना में विश्वास करता है। आदर्शवाद का मानना है कि भौतिक संसार नहीं वरन् आध्यात्मिक संसार अधिक श्रेष्ठ है, क्योंकि जो भौतिक वस्तुएं हैं, उनका अस्तित्व क्षणभंगुर है, परंतु व्यक्ति के भाव, आदर्श, सद्विचार सनातन धर्म आदि आदर्शवाद व्यक्ति तथा उसके मस्तिष्क के अध्ययन पर अधिक बल देता है। आदर्शवाद में शरीर के स्थान पर मन तथा ईश्वर की महत्ता मानी जाती है। आदर्शवादी दर्शन के अनुसार आत्म तत्व या चेतना ही इस संसार का मूल है तथा इसी के कारण सृष्टि कल्पना तथा निर्माण संभव हुआ है तथा भौतिक जगत इसी के बाद अस्तित्व में आया है। इस दर्शन का मानना है कि चेतना की अपनी स्वतंत्र सत्ता है तथा उसका मस्तिष्क या शरीर से कोई सरोकार नहीं है। आदर्शवाद में माना गया है कि मनुष्य में बुद्धि तथा विवेक सभी जीवधारियों से अधिक होता है तथा इसी कारण वह अन्य पशुओं के समान वातावरण का दास नहीं बनता है बल्कि उसमें बदलाव करके या तो उसे स्वंय के अनुकूल बना लेता है तथा इस समय संसार में जो सांस्कृतिक तथा सामाजिक वातावरण है वह भी मनुष्य के द्वारा निर्मित है। इस प्रकार आदर्शवाद मानव व उसके विचारों, भावों, आदर्शों को महत्वपूर्ण मानता है। तथा आदर्शवाद का मानना है कि इन्हीं विचारों, आदर्शों, मूल्यों को प्राप्त करके मनुष्य अपने व्यक्तित्व का विकास करता है तथा आत्मा के द्वारा सच्चा ज्ञान प्राप्त करके ईश्वर से साक्षात्कार का प्रयास करता है। आदर्शवाद का मानना है कि वास्तविक सत्ता अध्यात्म की होती है भौतिक नहीं। इस सिद्धांत का मानना है कि राज्य की चेतना के बिना किसी प्रकार की भौतिक सत्ता नहीं होती है तथा राज्य नैतिक मान्यताओं के अनुरूप ही अपना कार्य करता है। यह कोई बनायी

गई संस्था या समुदाय नहीं है, अपितु राज्य को मानव की इच्छा के अनुसार ही संगठित किया जाता है। आदर्शवादी दर्शन के बहुत से और विविध रूप हैं परंतु सबका आधारभूत तत्व यही है कि संसार का उत्पादन कारण मन तथा आत्मा है तथा मानसिक स्वरूप ही वास्तविक स्वरूप है। आदर्शवादी इस बात का संकेत देते हैं कि संसार को समझने के लिए मन अथवा मस्तिष्क सर्वोपरि है। उनके लिए इससे अधिक और कोई बात नहीं है कि मन संसार को समझने में लगा रहे, और किसी बात को इससे अधिक वास्तविकता नहीं दी जा सकती है, क्योंकि मन से अधिक किसी और बात को वास्तविक समझना स्वंय मन की कल्पना होगी। इस प्रकार इसका जन्म उसी समय से माना गया है जब मनुष्य ने सोचना प्रारंभ किया था तथा पूर्व तथा पश्चिम दोनों सभ्यताओं से मिलकर ही इस सिद्ध ांत का जन्म माना गया है।

**आदर्शवाद के प्रमुख सिद्धांत**

आदर्शवादी विचारधारा के अनुसार, संपूर्ण संसार दो रूपों में विभक्त है– (1) आध्यात्मिक संसार (2) भौतिक संसार। आदर्शवादी सिद्धांत का मानना है कि आध्यात्म का ज्ञान होना मनुष्य के लिए परम आवश्यक है। इसलिए आदर्शवादी भौतिक जगत को प्रमुखता देता है। इस विचारधारा के अनुसार भौतिक वस्तुएं क्षणभंगुर होती है। आचार तथा धर्म पर निर्भर आदर्शवाद को नैतिक आदर्शवाद भी कह सकते हैं। इस प्रकार के आदर्शवाद का व्यापक प्रभाव पड़ता है। इसमें, मानव शारीरिक वासनाओं का परित्याग कर व्यक्ति और समाज को किसी वृहत्तर आदर्श की ओर ले जाने का प्रयत्न करता है। 'रामचरितमानस' 'कामायनी' 'रंगभूमि', 'कुरूक्षेत्र', 'द्वापर' और 'महाभारत' आदि नैतिक आदर्शवाद की रचनाएं हैं। टालस्टाय, रवीन्द्रनाथ, रोमारोलाँ, प्रेमचन्द गाँधी और प्लेटो आदि नैतिक आदर्शवादी विचारक थे। कलावादी आदर्शवाद के समर्थक धार्मिक, नैतिक अथवा आध्यात्मिक आदर्श के विपरीत हैं। वे लोग आदर्शवाद के मूल में निहित विवाद का विरोध करते हैं। 'क्रोचे' इस वर्ग के नेता है। वह मन की विशुद्ध कल्पना से काव्य या कला का जन्म मानते है। और उसे आधार तथा धर्म से पृथक र खते है। यह विचार भी एक प्रकार का आदर्श है, जिसे कलावादी आदर्श कहा जाता है। आदर्शवाद का तीसरा रूप यथार्थवादी आदर्शवाद का है। इसमें आदर्शवादी सिद्धांतों को जीवन की यथार्थवादी परिस्थितियों में रखकर देखा जाता है। प्रेमचंद का आदर्शमूलक यथार्थवाद बहुत कुछ इससे मिलता जुलता है।

हिन्दी साहित्य में आदर्श तो हमेशा ही रहा है, प्राचीन साहित्य में आदर्श की ही प्रधानता है। तुलसीकृत 'रामचरितमानस' इसका सर्वश्रेष्ठ उदाहरण है। ''रामचरितमानस में सीता, भरत और हनुमान क्रमशः पतिव्रत, भ्रातृभक्ति और सेवाभाव के ऐकांतिक आदर्श हैं। दशरथ, कैकेयी, लक्ष्मण, मुनि, मंत्री, निषाद आदि को यथार्थ चरित्र की श्रेणी में रख सकते हैं।''

हिन्दी साहित्य में आरंभ में वीरता का आदर्श मान्य था। राजस्थान के कवियों में ऐसे कितने ही किरणोज्जवल आदर्शों की स्थापना की थी, जो इतिहास में अमर हो जाए। भक्तिकालीन साहित्य में आदर्श बदल गया। प्रेमसंबंधी उच्चतम आदर्शों की स्थापना इस काल में हुई। मध्यकालीन आदर्शों की सबसे मनोरंजक झांकी तुलसी के 'मानस' में मिलती है। आदर्शवाद का ध्यान सतोगुण की ओर रहता है।

उसका एक मनोवैज्ञानिक पक्ष भी है। वह समाज की कुप्रवृत्तियों का परिष्कार करता है और उसमें सुप्रवृत्तियों को जाग्रत करता है। इस दृष्टि से देखने पर मध्यकालीन वैष्णव संतों का साहित्य आदर्शवादी भावनाओं से ओत–प्रोत दिखाई पड़ता है। सगुण और निर्गुण काव्यधारा के समस्त साहित्य में यह आदर्शवाद वर्तमान है।

रीतिकालीन साहित्य में किसी विशिष्ट आदर्श के दर्शन नहीं होते। आधुनिक साहित्य में व्याण, बलिदान जैसे राष्ट्रीय आदर्शों की स्थापना हुई। 'यशोधारा', 'राधा', 'उर्मिला' जैसे आदर्शवादी चरित्रों की उद्भावना द्विवेदीयुगीन साहित्य के कवियों ने की। छायावाद में सौन्दर्य और प्रेम के आदर्शों की स्थापना की, जो नैतिकता की बेड़ियों में जकड़े हुए नहीं थे।

भारतेन्दुकालीन साहित्य में भी इसका रूप वर्तमान है। द्विवेदी युग के काव्य, तथा कथासाहित्य में आदर्शवाद की स्पष्ट झलक है। प्रेमचन्द्र, प्रसाद, गुलेरी जी, वृन्दावनलाल वर्मा और दिनकर जी के साहित्य में भी इसकी झलक मिलती है।

जयशंकर प्रसाद का उपन्यास 'तितली' प्रेम के आदर्शस्वरूप एवं आत्म संयम के वर्णन का प्रयास है। प्रसाद का 'कंकाल' यदि यथार्थवाद की ओर उन्मुख है तो 'तितली' पूर्णतः आदर्शवादी उपन्यास है। 'तितली' भारतीय नारीत्व का प्रतीक है। जिसके रूप में प्रसाद का नारी–आदर्श प्रतिफलित हुआ है।

'सेवासदन' हिन्दी उपन्यास में एक नवीन दिशा का सूचक होकर आया है। इस तरह प्रेमचन्द की अन्य कृतियों द्वारा हिन्दी उपन्यास के नवीन रूप तथा आदर्श की प्रतिष्ठा हुई और जीवन को उसकी समग्रता में व्यक्त करने का श्रेष्ठतम साधन बना। अतः अपने उपन्यासों में यथार्थवादी शैली का उपयोग करके भी उद्देश्य में प्रेमचन्द आदर्शवादी ही रहे।

**आदर्शवाद के गुण एवं दोष–**

**गुण –** इस सिद्धांत में विश्वास रखने वाले व्यक्ति इस तथ्य को समझते हैं कि मनुष्य में सत्यं, शिवं, सुन्दरं जैसे सनातन मूल्यों का विकास हो तभी व्यक्ति अपनी आध्यात्मिक पूर्णता को प्राप्त करने में सक्षम हो सकेगा। इसी भावना से व्यक्ति का नैतिक विकास भी होगा। आदर्शवाद व्यक्ति के आध्यात्मिक विकास के पक्ष पर भी ध्यान देता है तथा वह सांसारिक वस्तुओं की अपेक्षा आध्यात्म को महत्वपूर्ण मानता है।

**दोष–** आदर्शवाद के दोषों में पुरानी परिपाटी का अनुसरण, वर्तमान जीवन से संबंध विच्छेद, अस्वाभाविकता से परिपूर्ण, धार्मिक संकीर्णता का समावेश, स्वतन्त्रता की बद्धता रहती है। आदर्शवाद व्यक्ति के जीवन के आध्यात्मिक पक्ष का विकास करता है तथा व्यावहारिक संसार के कार्यों से दूर रखता है जबकि आज के समाज में प्रत्येक व्यक्ति कार्य करके धान कमाना चाहता है तथा अपनी रोटी, निवास व अन्य दैनिक आवश्यकताओं को पूर्ण करना चाहता है।

**उपसंहार–**

आदर्शवाद के गुण–दोषों और विशेषताओं के विवेचन से यह निष्कर्ष निकलता है कि साहित्य की पूर्णता के लिए दोनों वादों का सन्तुलित समन्वय अत्यन्त आवश्यक है। एक ही साहित्यकार आदर्शवादी और यथार्थवादी– दोनों ही हो सकता है। किसी भी सफल कलाकार को दोनों ही वादों को लेकर चलना आवश्यक है क्योंकि साहित्यकार यदि कोरे आदर्शवाद को लेकर चलता है तो लोक का उस पर विश्वास नहीं जमता, वह केवल स्वप्नलोक या स्वर्ग की बात हो

जाती है। इस तक पहुंचने के लिए समाज अपने को समर्थ नहीं पाता। अतः उसको छोड़ बैठता है। इसी प्रकार यदि कोई साहित्यकार कोरे यथार्थवाद का ही चित्रण करता है, तो मनुष्य के संकल्प और उन्नति की प्रवृति तथा सदभावना को प्रेरणा नहीं मिलती। उसकी आत्मा को संतोष प्राप्त नहीं होता और समाज की अनेक समस्याओं का समाधान भी नहीं होता। अतः वह लोक का अधिक कल्याण नहीं कर सकता। इसलिए आवश्यक यही है कि साहित्य आदर्श और यथार्थ दोनों ही को अपनाकर चले। उसका भवन यथार्थ की नींव पर खड़ा हो, पर उसका विकास प्रस्तार और ऊँचाई के लिए आदर्शवाद का विस्तृत और उन्मुक्त आकाश रहे। ऐसा साहित्य ही सर्वजन–सुलभ, सर्वमान्य और सर्वहितकारी हो सकता है। यहां आदर्शवाद से हमारा अभिप्राय यथार्थवादियों के उस आदर्शवाद से है जो प्रगति की प्रेरणा देता है। न कि कोरे स्वप्न देखने वाले उन आदर्शवादियों के आदर्शवाद से जो शे खचिल्लियों का स्वर्ग होता है।

**संदर्भ ग्रंथ–**


- आदर्श और यथार्थ– पुरूषोत्तम लाल श्रीवास्तव पृष्ठ सं0– 127–129
- दृष्टि और दिशा साहित्यिक निबंध– डा0 चन्द्रभान रावत, पृष्ठ सं0– 38

# भारत में जनजातियों के मानचित्रण कलाए. संस्कृति. परंपरागत और आधुनिकता (बस्तर जिला के गोण्ड जनजातियों के विशेष सन्दर्भ में)

दिलीप कुमार शुक्ला, शिक्षा विभाग, क्राईस्ट कॉलेज, जगदलपुर, छ.ग., भारत

**सार संक्षेप :** *भारत के संविधान की धारा 46 में लिखा गया है कि राज्य जनता के कमजोर तबको विशेष अनुसूचितजातियों और आर्थिक हितों को विशेष सुविधा देगा और उनकी प्रत्येक प्रकार के सामाजिक अन्याय और शोषण से रक्षा करेगा और जनजातीय समुदाय देश के कुल 15 प्रतिशत क्षेत्र भाग में फैले हुए है। इनका भारत में जनजातियों के मानचित्रण कला और संस्कृति , परंपरागत और आधुनिकता पर वर्तमान स्थिति में कितना अपने आपको अपना परंपरागत ,संस्कृति को किस तरह निभा रहे है और इसमें आधुनिकता किस तरह हावि है।*

*आदिवासियों में अपनी पृथकता का बहुत अभास है और वे अपने आपको गैर'–आदिवासी जातियों, मुसलमानो और ईसाइयों से अलग मानते है। भाषा उनकी पहचान का एक बहुत बडा आधार है। बहुत सी जनजातियॉ ऐसी पहाडी और जंगली क्षेत्रों में रहती है जहॉ जनसंख्या छितरी हुई है और संचार कठिन है। आदिवासी पूरे उपमहाद्वीप में फैले है, परन्तु पश्चिम बंगाल, बिहार, उडीसा, मध्यप्रदे I.,., राजस्थान, छत्तीसगढ, गुजरात और महाराट, में इनका मुख्य आधार है। **एन.के. बोस** की तरह **आंद्रे बेत्तेई** ने भी जनजातियों के वर्गीकरण के मुख्य आधार ,भाषा ,धर्म और पृथकता की बतलाया हैं। उनकी मुख्य समस्याएँ, निध नितता, बेरोजगारी,. ऋणाग्रस्तता, पिछडेपन ,और अज्ञानता की है। जब एक संस्कृति किसी दूसरी संस्कृति के सम्पर्क में आती है तो लोग परस्पर प्रभावित होते है। आमतौर पर छोटा समुदाय बडे समुदाय से प्रभावित होता है। भारतीय संस्कृति में खान, पान की समृद्ध परंपरा पूरे विश्व में उसे शिखर पर स्थापित करती है। हजारों देवी–देवताओं और श्रद्धा–विश्वास –सबूरी वाले हमारे देश में व्यंजनों की परपंरा सदियों से चली आ रही है। अब राजा महाराजा वाली बात नही रही ,लेकिन गरीब से लेकर अमीर तक भारतीय व्यंजनों की परंपरा को संरक्षित रखते हुए इसे और समृद्ध बनाने में जुटे हुऐ है। भारतीय परंपरा में अभूणों की पहचान विश्व में सबसे अधिक भारत में ही है।*

*छत्तीसगढ. भारत के ह्रदय में बसा है, बस्तर इसकी आत्मा है, इसलिए भारत की गौरवशाली परंपरा के सभी आयाम यहां भी विधमान है, छत्तीसगढ. तीज –त्यौहारों का क्षेत्र है। जुलाई माह से छत्तीसगढ. के बस्तर में भी तीज त्यौहारों का मौसम शुरू हो जाता है। आदिवासी क्षेत्र बस्तर में आदिवासी संस्कृति और परंपरा ने अनेक अभूषणों की श्रृंखला दी है। आज भी बस्तर की कन्याएँ सिर पर कौडी और चांदी के लरों से सुंसज्जित गहने पहनकर अपनी परंपरा को सुरक्षित रखी हुई है। बस्तर जिले के प्रमुख तीज त्यौहार – माटी –तिहार , भिमा जतरा ,गोन्चा ,अमुस तिहार, नवाखानी ,दशराहा, दियारी, मंडाई आदि। बस्तर के प्रमुख जनजाति गोण्ड , हल्बा ,भतरा ,मुरिया, अबुझमाडिया आदि। बस्तर जिले में गोण्ड जनजाति लगभग सभी विकास खण्डों में निवास करते है। इनकी भाषा, बोली, रहन–सहन, खान–पीन, पहनवा इनकी संस्कृति एवं परंपरा इनकी पहचान*

*है। शिक्षा की दृष्टि से पिछडा जनजाति है। छत्तीसगढ. के जनजातियों में गोण्ड सबसे बडी जनजाति है, जो कि राज्य के दक्षिण हिस्से में निवास करती है। माना जाता है कि यह जनजाति द्रविडवंश से है। वस्तुतः 'गुण्ड' शब्द तेलगु के (कोडशब्द) बना है, जिसका अर्थ पर्वत होता है। गोण्ड अधिकाशंतः बस्तर के पठार तथा छत्तीसगढ. बेसिन तक विस्तृत है। राज्य में गोण्डों की कुल 30 शाखाएँ है। जिनमें प्रमुख रुप से अबुझमाडिया, दंडामी ,दरिया आमत गोण्ड, सबरिया गोण्ड ,सिघरोलिया गोण्ड , सरगुंजिया गोण्ड , नागवंशी , ठटिया, राजमुरिया ,किलभूता, ओझा एवं एकगोण्ड मुरिया इत्यादि है। जनजातियों की संस्कृति ,और परंपरा का ह्रास हो रहा है। इनकी मुख्य वजह है, जो एक पीढी से दूसरी पीढी में हस्तांतरण होते–होते ह्रास हो रहा है। दूसरी ओर आधुनिकता से प्रभावित हो रहा है। छ.ग. की बस्तर में जनजातियों का संस्कृति ,परंपरा एक ओर शासन की गतिविधियों की वजह से,दूसरी ओर लगभग सम्पूर्ण छत्तीसगढ. सहित बस्तर जिले में नक्सलवाद के कारण इनकी संस्कृति ,परंपरा समाप्ति के कगार पर है। तीसरी ओर धर्मातंरण की वजह से प्रभावित है। जनजातियों का धर्म अलग है, जो देवताबूढा देव को मानते है। अगर समय रहते जनजाति समाज के लोगों को शिक्षित होकर अपने मानचित्रण कला ,संस्कृति को जीवित रखने के लिए ठोस कदम उठाये और धर्मातंरण पर रोक लगाये और इसे किस तरह संरक्षित किया जाय जिससे जनजाति अपने पहचान को न खो दे। इनकी प्राचीन गौरवशाली संस्कृति ,कला परंपरा आज भी भारत में विद्यामान है। कहना ना होगा की भारत की संस्कृति, परंपरा, कला की चर्चा जनजातियों के बिना अधूरी साबित होगी ।*

**भारत की जनजातियां** :–

भारत में नृजातीय समूहों में जनजातिय जनसंख्या का महत्वपूर्ण स्थान है जनजातिय लोक विभिन्न नृजातीय भाषाई तथा धार्मिक समूहों से सम्बन्ध रखते है, उनके सामाजिक तथा आर्थिक लक्षण भी विशिष्ट होते है ।

**भारतीय संविधान के अनुच्छेद :–**

अनुच्छेद 366 (25) के अनुसार जनजाति से तात्पर्य उन जनजातीय समुदाय अथवा जनजातीय समुदायों के अंशों या समूहों से है, जो संविधान के अनुच्छेद 342 के तहत् अनुसूचित जनजातियों के रूप में माने गए है। भारत सरकार की अधिसूचना के अनुसार इनकी कुल संख्या 550 है । सम्भवतः विश्व में जनजाति के सर्वाधिक लोग भारत में ही अनुसूचित जनजातीय जनसंख्या 2 .25 करोड़ थी, जो कुल जनसंख्या का 5.6 प्रतिशत भाग था 1 वर्ष 2011 में इनकी जनसंख्या बढ़कर 10.42 करोड़ हो गई जो कुल जनसंख्या का 86 प्रतिशत भाग था । ***जी0 एस0 धुर्ये*** ने अपनी पुस्तक दि शेड्यूल्ड ट्राइब्स (1959) के संशोधित संस्करण में लिखा है :– ''अनुसूचित जनजातियों को ना तो ''आदिम'' कहा जाता है और न ही ''आदिवासी'' न ही उन्हें अपने आप में एक कोटि माना जाता है। आमतौर पर उन्हे अनुसूचित जातियों के साथ शामिल किया जाता है, और पिछड़े वर्गो का एक समूह माना जाता है ''अनुसूचित जनजातियों के बारे में संवैधानिक दृष्टिकोण का यही सार है ।

**जनजातीय क्षेत्र :–**

जनजातीय समुदाय देश के कुल 15

प्रतिशत क्षेत्र भाग में फैले हुए है, जो भिन्न – भिन्न पारिस्थितिकी तथा भू – जलवायु स्थितियों वाले मै. दानी, पर्वतीय, जंगली और दुलर्भ क्षेत्रों में रहते

है भारतीय जनजातियों को उनके भौगोलिक विस्तार के अनुसार निम्न भागों में बॉटा जाता हैं ।

(1) उत्तर एवं उत्तर पूर्वी क्षेत्र (2) मध्यवर्ती क्षेत्र (3) दक्षिणी प्रदेश (4) द्वीपसमूह क्षेत्र

**जनजातीय अर्थव्यवस्था :–**

भारत की जनजातीय अर्थव्यवस्था का व्यापक अध्ययन सर्वप्रथम दो अर्थशास्त्रियों ने माना ***डी0एस0 नाग*** तथा ***आर0पी0 सक्सेना*** ने क्रमशः 1958 एवं 1964 में किया।

**जनजातीय अर्थव्यवस्था का वर्गीकरण :–**

विभिन्न विद्धानों ने जनजातीय अर्थव्यवस्था का वर्गीकरण किया है :–

(1) स्थानांतरित कृषि (2) स्थायी कृषि (3) सरल कारीगर (4) लोक – कलाकार

**छत्तीसगढ़ की जनजतियां :–**

1 नवम्बर 2000 को छत्तीसगढ. का भू – भाग म.प्र. से पृथक कर एक अलग छत्तीसगढ. राज्य बना दिया गया । छत्तीसगढ. राज्य निर्माण के अधोलिखित कारण है –

(1) भौगोलिक कारण
(2) सांस्कृतिक कारण
(3) प्रशासनिक कारण
(4) छत्तीसगढ. के साथ भेद – भाव
(5) औद्योगिक विकास
(6) बाहरी शोषण

छत्तीसगढ.एक आदिवासी बाहुल्य क्षेत्र है यह पर वन सम्पदा की प्रचुरता विद्यमान है आदिवासी, वनवासी, एवं जनजाति इत्यादि नामों से अविहित एक मानवीय समुदाय जो मानवीय सभ्यता के विकास सोपान को अभी तक पूर्ण रूप से स्पर्श नही कर पाये है जो अभी भी दुर्गम्य और सघन – वन प्रांतो की धरा में जड़ बने बैठे है उनका जीवन उनकी शैली उनका आचार – विचार उनकी संस्कृति हमें शान्ति और एकान्त में भौमिकता से दूर नैसर्गिक पवित्रता के साक्षी बनाते है । नव्– गठित छत्तीसगढ. प्रान्त मूलतः इन्ही प्रकृति – पुत्रों की प्रधानता लिये है ।

2001 की जनगणना के अनुसार छत्तीसगढ. राज्य में अनुसूचित जनजातियों की कुल जनसंख्या 66,16,59 है। छत्तीसगढ. राज्य की कुल जनसंख्या का 31.8 प्रतिशत भाग अनुसूचित जनजातियों का है विदित हो कि 1991 की जनगणना मे ंराज्य की कुल जनसंख्या का 32.5 प्रतिशत भाग अनुसूचित जनजातियों का था । छत्तीसगढ. राज्य में 42 अनुसूचित जनजातियां जो इस प्रकार है – अगरिया, अंध, बैगा, भतरा, भैना, भील,मुंडा, मुरिया, गोण्ड आदि ।

मूल रूप से राज्य में आदिवासी समूह तीन भाषा परिवारों मे विभाजित है ।

(1) मुंडा भाषा परिवार
(2) द्रविड़ भाषा परिवार
(3) आर्य भाषा परिवार

**जनजातियो का सामाजिक जीवन :–** जनजातीय समाज बहुत ही सरल है उनका सौजन्य उनका अतिथि सत्कार, उनका अनुशासन, उनकी सामुदायिकता, उनकी आत्म निर्भरता उनकी कठोर परिश्रम करने की क्षमता, उनका प्रकृति के साथ अद्भुत सामंजस्य उनके समाज की मौलिक विशेषताएँ।

**(1) जन्म संस्कार :–**

आदिवासी शिशु जन्म को प्राकृतिक घ

ाटना मानते है, गोड़ इसे झलनोदनी एवं दुल्हादेव की कृप्पा मानते है । छः दिनों तक माता अपवित्र मानी जाती है छठवें दिन छही मनाया जाता है

**(2) नामकरण :–**

नामकरण संस्कार बच्चे के जीवन का पहला संस्कार होता है जिसे विभिन्न जनजातियॉ अलग–अलग अवधि पर सम्पन्न करती है, बच्चे का नाम नदि, पहाड़, दिन, महिना, ऋतु या विशिष्ट अवसर के नाम पर रखा जाता है ।

**(3) विवाह पद्धति :–**

आदिवासी समाज में एक विवाह और बहुविवाह दोनों का प्रचलन है जनजातियों में विवाह संबंधी सीमाएं अधिक है :–

(1) क्रय विवाह (2) सेवा विवाह (3) गंधर्व विवाह (4) अपहरण विवाह (5) विधवा विवाह

(6) विनिमय विवाह (7) हठ विवाह

**जनजातीय युवा गृह :–**

जनजातीय युवागृह जनजातीय संस्कृतियों की प्राचीनता और मौलिक संस्थाएं उनकी विशेषतायें है। युवागृह उनमें से एक है यह जनजातियों की एक ऐसी संस्था है जो सांस्कृतिक दृष्टिकोण से महत्वपूर्ण है । युवा गृह अविवाहित लड़कों एवं लड़कियों का एक ऐसा संगठन हैं जिसका कार्य अपने समाज की संस्कृति से परिचय कराना तथा अपनी संस्कृति के अनुरूप उनके मानसिक विकास को सुनिश्चित करना है ।

**जनजातियों का धार्मिक जीवन :–**

आदिवासी का सम्पूर्ण जीवन चक्र धर्म पर आधारित होता है । हिन्दु देवी – देवता भी होते है जो हिन्दु शास्त्र में नही मिलते है । इनके देवता है – दुल्हादेव, बुढ़ादेव, ठाकुरदेव, धर्मादेव, करमदेव एवं देवियॉ है – खुरियाराती, भूमिमाता, दंतेश्वरी, माहामाया आदि ।

**जनजातियों के देवी देवता :–**

जनजातियों के हर गांव में अपने देवी देवता है धार्मिक आस्था और अंधविश्वास का गहरा ताना बाना इस अंचल में विस्तारित है हर गांव में देवगुड़ी है।

**जनजातियों के प्रमुख आदिवासी देवता :–**

भंगाराम, बूढ़ादेव, डोकरादेव, बारह तरह के भीमा, कुंवर, भैरमबाबा, आंगापाटदेव, पाटदेव, ।

**जनजातियों की प्रमुख आदिवासी देवियां** :–

केशरपालीन, मावली, तेलगीन, शीतलादई, हिंगलाजीन, कंकालीन, सातवाहिनी, घाटमंडीन ।

**बस्तर जिले के जनजातियां :–**

बस्तर एक देशी रियासत थी जिसका विलय स्वतंत्रता प्राप्ति के बाद भारतीय गणमान्य मे किया गया । बस्तर राजवंश के अन्तिम राजा प्रवीरचन्द्र भंज. देव 1936 में उनकी माता प्रफुल्ल कुमारी के निधन के बाद अंग्रेजों ने उन्हें गद्धी सौंपी आजादी के बाद देश अन्य देशी रियायतों के साथ–साथ बस्तर रियासत को भी भारतीय गणराज्य में विलयकर दिया गया।

**बस्तर का नामकरण :–**

बस्तर के नामकरण के सबध में भी किंवद. न्तियां है। एक किवंदन्तियां है कि बस्तर की नीव डालने वाले चूँकि बॉस के तले में निवास करते थे अतः यह बांस ही बस्तर कहलाने लगा। बस्तर के सभी विकास खण्डों में जनजीवन निवास करती है। जिसमें मुख्यतः गोण्ड, मुरिया, माड़िया, हल्बा, भतरा, अबुझमाड़िया, इत्यादि हैं । इनकी भाषा बोली रहन,

सहन, संस्कृति, लोकगीत, इत्यादि अलग पहचान है । बस्तर का जिला मुख्यालय जगदलपुर है यह पर शाासन के प्रयास से यह 5वीं अनुसूची लागू है । इनके लिए आरक्षण व्यवस्था है ।

बस्तर जिला में दिसम्बर माह से मड़ई, मेले का शुभारंभ होता हैं बस्तर की लोक संस्कृति मेले और मंड़ई में अपने सम्पूर्ण उत्साह के साथ खिलखिला उठती है । बस्तर का समस्त सांस्कृतिक जीवन इन दिनों उन्मुक्त हो उठता है । प्रकृति के मे वन्य पुत्र पूर्ण मौलिकता के साथ अपने लोकजीवन के आंनद का अमृतपान करते है । बस्तर जिले की प्रथम मड़ई जगदलपुर से 22 मील दूर केशरपाल ग्राम में देवी मां केशरपालिन के सम्मान में भरती है । यूं तो लगभग सम्पूर्ण बस्तर के हर क्षेत्र में अपनी – अपनी परम्पराओं के अनुसार मंड़ई कहते है और दूसरे दिन को बासी मड़ई कहते है । मंड़ई मे आसपास ग्राम के समस्त देवी – देवता आंमत्रित रहते है । विशेषकर इन मड़ई व मेले मे स्थानीय आंगा देव का विशिष्ट महत्व होता हैं ।

**26 जनवरी 2015 गणतंत्र दिवस पर दिल्ली में बस्तर दशहरे की झांकी :–**

राज्य के प्रसिद्ध बस्तर दशहरे की झांकी दिल्ली के गणतंत्र दिवस परेड के लिए चुनी गयी थी। तीन माह की चयन प्रक्रिया के बाद इसे रक्षा मंत्रालय की विशेषज्ञ समिति ने हरी झंडी दिखायी थी। जन. संपर्क विभाग के संचालक रजतकुमार ने बताया कि झांकी के साथ बस्तर के 30 से अधिक लोक नर्तक भी सम्लित हुऐ थे। जनसंम्पर्क विभाग के प्रमुख सचिव अभिताभ जैन ने बताया कि झांकी से जहा छत्तीसगढ. की समृद्ध संस्कृति के बारे में लोग जानेंगे वही दूसरी ओर इससे राज्य के पर्यटन को भी बढ़ावा मिलेगा बस्तर दशहरा 75 दिन तक मनाया जाने वाला ऐतिहासिक पर्व है यह 532 वर्ष पुराना है। इस समारोह के मुख्य अतिथि अमेरिका के राष्ट्रपति श्री बराक ओबामा शिरकत कर सहारनीय किया था

**गोण्ड जनजातियां :–**

छत्तीसगढ. सहित बस्तर के जनजातियों के गोण्ड सबसे बडी जनजाति है ,जो कि राज्य के दक्षिण हिस्से में निवास करती है। माना जाता है कि यह जनजाति द्रविडवंश से है। वस्तुतः 'गुण्ड' शब्द तेलगू के (कोड शब्द) बना है, जिसका अर्थ पर्वत होता है। गोण्ड अधिकांशतः बस्तर के पठार तथा छत्तीसगढ. बेसिन तक विस्तृत है। राज्य में गोण्डों की कुल 30 शाखाएं है। जिनमें प्रमुख रुप से अबुझमाडिया, दडामी ,ददिया ,आमत गोण्ड, सबरिया गोण्ड ,सिंध ारोलिया गोण्ड, सरगुजिया गोण्ड, नागवंशी ठटिया, राजमुरिया, किलभूत, ओझा एवं एक गोण्ड मुरिया इत्यादि है, बस्तर जिले के सभी विकासखण्डों में निवास करते है।

**<u>वस्त्राभूषणः</u>–**

गोण्ड प्रायः सूती वस्त्र पहनते है और निक. टवर्ती कस्बे से कपडा क्रय कर सिलाई स्वयं करते है। अपने पशुओं से ऊन प्राप्त कर कम्बल बनाते हैं। स्त्रियां मूंगा और नकली मोतियों के बने आभूषण गले और हाथेां में पहनती है। एल्यूमिनियम की बाली पहनती है। गोण्ड युवतियों के मुख ,हाथ एवं जांघ को गुदाने का अत्यंधिक प्रचलन है। वे अपने जूडे को बडे सफाई के साथ तैयार करती है, इसके लिए सफेद बांस के जंघ का या अन्य कंघं जो स्थानीय तौर तरीके

पर बनाते है, इस्तेमाल करती है, प्रत्येक युवती के पास 4–6 कंघे होना जरुरी है।

**गोण्ड जनजातियों के नृत्यः–**

**1. हुलकि व मांदरी :–**हुलकी नाचा यह अधिकत्तर सितम्बर–अक्टुबर माह में गोण्ड युवक –युवतियों के द्व ारा सामुहिक नृत्य करते है और तुड– तुडी बजाते है।

**2. मांदरी नृत्यः–** मांदरी नृत्य में मांदर की करताल पर नृत्य किया जाता है। इसमें गीत नही गाया जाता है। यह घोटुल का नियमित नृत्य होता है। थापों के संयोजन पर ही चिटकुल बजाई जाती है। यह नृत्य लगाकर कई घंटों तक चलता है मांदरी नृत्य लगभग प्रत्येक रीति ,रिवाजों ,पर्व उत्सवों पर किया जाता है।

**3. हुलकी नृत्यः–** हुल्की पाटा घोटुल का सामूहिक मनोरंजक गीत है। इसे अन्य सभी अवसरों पर भी किया जाता है। इसके गीत नुत्य के मुख्य आकर्षण होते है, हुलकी पाटा में लडकियों और लडके दोंनों भाग लेते है।

**शोध कार्य की अवधि में प्रयोग किये गये प्रविधियां :–**

विषय वस्तु का व्यापक विस्तृत व बारीकी अध्ययन करना एक जटिल प्रकिया है। यह शोध प्रबंध सामाजिक शोध प्रणालियों पर आधारित है। विषय वस्तुओं से सबंधित सामाग्री का संग्रहण निम्न प्रविधियों के द्वारा किया गया है ।

क ) प्राथमिक स्त्रोतो से विषय वस्तु का संग्रहण :–

यह सामाग्री मेरे द्वारा निम्न प्रविधियों का प्रयोग संग्रहित किया है ।

1 ) साक्षात्कार के लिए सैंम्पलिंग आदि।

2 ) सर्वेक्षण के लिए सैंम्पलिग ।

3 ) अवलोकन।

4 ) निजी स्तर पर प्रदर्षित तथ्यों या लेखो का संकलन।

5 ) प्रश्नावली ।

ख ) द्वितीय स्त्रोतों से सामाग्री संग्रहण हेतु :–

सामचार पत्रो पत्रिकाओं विषय वस्तु से सबंधति पुस्तको, समाज प्रमुखो, सम्बधी प्रकाशित लेखों आदि का साहारा लिया गया है ।

**संदर्भ ग्रंथ सूचि**

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3 शर्मा डॉ0 तृषा – '' छ0 ग0 इतिहास ,संस्कृति एवं परम्परा '' वैभव प्रकाशन रायपुर छ0ग0 2010।

4 श्रीवास्तव डॉ0ए0आर0एन0 –''जनजातीय भारत'' म0प्र0 हिन्दी ग्रन्द अकादमी 2004।

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6 वैष्णव हरिहर एवं वैष्णव खेम –''बस्तर के तीज –त्यौहार बस्तर '' सम्भाग हल्बी साहित्य परिषद छ0 ग0 2002।

**दैनिक समाचार पत्र**

1 पत्रिका पेपर 2 नवभारत पेपर 3 दैनिक भास्कार

**पत्र एवं पत्रिका**

अनुसूचिति क्षेत्र हेतु महत्वपूर्ण संहिता /अधि ानियमों में संशोधन पंचायत उपबंध अधिनियम 1996 के तहत अनुसूचित जनजातियों एवं क्षेत्रों के लिये भूरिया समिति की अनुशंसाओं पर आधारित, आदिम जाति एवं अनुसूचित जाति कल्याण विभाग ,म0प्र0।

**प्रमुख तीज त्यौहार (लोकपर्व ):–**

संस्कृति को प्रवाहमान बनाने में लोक पर्वो का मत्वपूर्ण स्थान होता है। ये जीवन्त बना देते है। इन पर्वो के आयोजन के पीछे भावना जो भी हो ,पर ुओं ,इसाइयों और अन्य समुदायों की जीवन प्रणालियों संस्कृति संरक्षण की दृष्टि देखा जाए तो मूलतः को अपना लिया है। इन विभेदों के कारण जनजातियों इनके द्वारा हमारी संस्कृति निरंतर पोषित होती रही में सामाजिक , राजनैतिक चेतना के स्तर और है। पर्वो की दृष्टि से . छत्तीसगढ. के जनजातिय वर्ष संस्कृति ,कला और आधुनिकता के सन्दर्भ में अन्तर के बारह महीने में कोई न कोई पर्व होता है।

**जैसे :–** 1 हरेली 2 नवाखानी 3 छेर छेरा

**जनजातियों की सहभागिताः–**

बस्तर जिले की गोण्ड जनजातियों के मानचित्रण कला ,संस्कृति और परम्परागत एवं आध ुनिकता से संबंधित विभिन्न पहलुओं पर विश्लेशण प्रस्तुत करता है। प्राथमिक स्त्रोंतों के आधार पर प्राप्त तथ्यों से जनजातिय सहभागिता की स्थिति नवीन आध ार दिया गया है। जो नवीन आधार से जनजातीय की संस्कृति ,कला, को आधुनिक परिवेश में अनुमान लगया जा सकता है। इसमें मुख्य रूप से उत्तरदाताओं की सहभागिता का उद्धेश्य मानचित्रण कला, संस्कृति , परम्परागत और आधुनिकता गोण्ड जनजातियों की सहभागिता के आधार एवं संबंधों की प्रकृति में उनकी रूचि निर्णयक स्थिति तथा विकास सहभागिता के प्रभाव से सम्बंधित तथ्यों को सारिणियों के माध्यम से दर्शाया गया है।

**सुझाव एवं निष्कर्ष :–**

भारत में जनजातियॉ एक अखण्डित जन समुदाय नही है। ऐतिहासिक, पृष्ठभूमि ,सामाजिक , आर्थिक ,सांस्कृतिक समास्याओं और प्रगति के स्तर के सन्दर्भ में उनमें अन्तर पाए जाते है। कुछ जनजातियां वनों में और पहाडियों पर रहती है, जबकि अन्य मैदानी पर रहती है, कुछ स्थायी कृषक है तो कुछ वनों की उपज पर निर्भर करती है। कुछ जनजातियां वृहद समाज के गहरे सम्पर्क में रही हैं और उन्होंने हिन्द. पाए जाते है । सामान्यतः सभी जनजातियां आज भी कमजोर वर्ग की है। संक्षेप में बस्तर जिले के जनजाति प्राचीन समय से सभी वर्तमान में भी कमजोर है और इसे अपने संस्कृति ,कला, परम्परागत को प्रभावित करने में धर्मान्तरण एवं नक्सलवाद प्र नवाचक चिन्हों के दायरे में है।

**सुझाव :–**

1 अंचल की जनजाति की मानचित्रण कला, संस्कृति , परम्परागत को सर्वोच्च प्राथमिकता दिये जाने की आवश्यकता है। सम्पुर्ण बस्तर जिले में इस हेतु विशेष कार्यक्रम बनाया जाये ।

2 जनजाति के दोयम दर्जे का मुख्य कारण उनकी आर्थिक पराधीनता है।

3 धर्मान्तरण का उपाय खोजा जाना आवश्यक है।

4 नक्सलवाद की समस्या का त्वरित समाधन आव यक है। (चाहे बातचीत से हो या अन्य तरीकों से) अन्याथा समूचे बस्तर में मानचित्रण , कला, संस्कृति एवं परम्परागत कभी भी सम्पूर्ण अर्थो में सफल नही हो सकेगी ।

5 आधुनिकता से जनजाति प्रभावित हो रहे । इसे रोका जाना चाहिए।

**निष्कर्ष :–** यह कहा जा सकता है कि बस्तर जिले के विभन्न स्तरों के जनजातियों की संस्कृति ,मानचित्रण , कला, परम्परा, कई दशक उपरान्त भी संक्रमणकालीन

दौर से गुजर रही है, लेकिन भविश्य में इसके ढोस एवं सकारात्मक परिणाम दिखाई देगे ,ऐसे भुभ संकेत अवश्य मिलने लगे है। शासन द्धारा जनजाति के लिए विशेष प्रशिक्षण शिविर लगाने ,प्रदेश में समाज जागरूकता एवं बैठक होते रहते है। और भासन ने जनजातिय विद्यालय भी खेाला जा रहा है। इससे प्रादेषिक स्तर पर जनजाति संस्कृति ,मानचित्रण कला, परम्परागत और आधुनिकता दोनों को बनाये रखेगा और जनजाति की नयी पीढी तैयार करने में सहभागिता होगा। ताकि इक्कीसवीं सदी एक नवीन ग्रामीण समाज का शिलान्यास सम्भव हो सके व विक. न्द्रीकरण के वास्तविक लक्ष्यों को व्यवहार में प्राप्त किया जा सके ,किन्तु ऐसा तभी संभव है जब यह जनजाति नेतृत्व सततः जागरूकता क्रियाशीलता, नियंत्रण–निर्देशन व समन्वय की क्षमता का परिचय देते हुए अपने दायित्वों को समझे अन्यथा अस्थिर दि ाहीन अल्पशिक्षित ,अनुत्तरदायी व उदासीन जनजाति मानचित्रण कला, संस्कृति ,परम्परागत व्यवस्था के लिए आधुनिकता वह व्यवस्था के लिए निरर्थक सिद्ध हो सकता है।

## तालिकाएँ

**सारणी क्रमांक 1.01**

**जनजातियों के मानचित्रण कला,संस्कृति सबंध**

| प्रश्न संख्या | प्रश्न | उत्तरदाताओं की संख्या | हॉ | नहीं | प्रतिशत |
|---|---|---|---|---|---|
| | | | | | |
| 1 | कला, संस्कृति जीवित हैं | 50 | 060 | 040 | 60.00 |
| 2 | धर्मान्तरण | 50 | 080 | 020 | 80.00 |
| 3 | नक्सलवाद | 50 | 100 | 000 | 100.00 |
| 4 | भाषा जीवित | 50 | 060 | 040 | 60.00 |
| 5 | शासन सहयोग | 50 | 040 | 060 | 40.00 |
| | कुल | 250 | 340 | 160 | 340.00 |

**सारणी कमांक1.02**

परम्परागत एवं आधुनिकता सबंध

| प्रश्न संख्या | प्रश्न | उत्तरदाताओं की संख्या | हॉ | नहीं | प्रतिशत |
|---|---|---|---|---|---|
| | | | | | |
| 1 | परम्परागत | 50 | 050 | 05 | 50.00 |
| 2 | परम्परागत टुट | 50 | 070 | 03 | 70.00 |
| 3 | परम्परागत विचार | 50 | 080 | 02 | 80.00 |
| 4 | आधुनिकता से यंवा वर्ग | 50 | 060 | 04 | 60.00 |
| 5 | शिक्षित से | 50 | 060 | 04 | 60.00 |
| | कुल | 250 | 320 | 18 | 320.00 |

# A study on Employee's performance appraisal system of Banks in Jagdalpur city

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## Abstract

*Human resource management (HRM or simply HR) is a function in organizations designed to maximize employee performance in service of their employer's strategic objectives.HR is primarily concerned with how people are managed within organizations, focusing on policies and systems. HR departments and units in organizations are typically responsible for a number of activities, including employee recruitment, training and development, performance appraisal, and rewarding (e.g., managing pay and benefit systems). HR is also concerned with industrial relations, that is, the balancing of organizational practices with regulations arising from collective bargaining and governmental laws. Among the core HR activities there are payroll, time and labour management, benefit administration and HR management. These activities correlate with the HR objectives which are largely the responsibility of Human Resources. In this project " A study on employee's performance appraisal system of Banks in Jagdalpur city", the questionnaire methodology was adopted and the employees working in both Private and Public sector bank were contacted in order to know about the performance appraisal system of their respective Banks. The area of the study was restricted to Jagdalpur and only 100 respondents were selected.*

## Introduction of Performance Appraisal

Performance Appraisal is the systematic evaluation of the performance of employees and to understand the abilities of a person for further growth and development. Performance appraisal is generally done in systematic ways which are as follows:

1. The supervisors measure the pay of employees and compare it with targets and plans.
2. The supervisor analyses the factors behind work performances of employees.
3. The employers are in position to guide the employees for a better performance.

Performance appraisals are a valuable performance management tool to evaluate the performance and value employees provide as well as set goals for the next review period. Most companies conduct performance appraisals annually, but they may also be done after a new hire completes the first 90 days of employment or on a monthly basis in situations where performance is an issue. Performance appraisal is the procuring, analyzing and documenting of facts and information about an employee's net worth to the organization. It aims at measuring and constantly im-

PERFORMANCE APPRAISAL AND JOB ANALYSIS

| Job Analysis | Performance Standards | Performance Appraisals |
|---|---|---|
| Describe the work and personnel requirement of a particular job. | Translate job requirements into levels of acceptable or unacceptable performance | Describe the job relevant strengths and weaknesses of each individual. |

proving the employee's present performance and tapping on the future potential.

### Objectives of Performance Appraisal

Performance Appraisal can be done with following objectives in mind:

- To maintain records in order to determine compensation packages, wage structure, salaries raises, etc.
- To identify the strengths and weaknesses of employees to place right men on right job
- To maintain and assess the potential present in a person for further growth and development.
- To provide a feedback to employees regarding their performance and related status.
- It serves as a basis for influencing working habits of the employees.
- To review and retain the promotional and other training programmes.
- Provide the opportunity for organizational diagnosis and development
- Facilitate communication between employee and employer
- Validate selection techniques and human resource policies to meet regulatory requirements.
- To improve performance through counseling, coaching and development.
- To motivate employees through recognition and support.

**Uses of Performance Appraisal**

1. Promotions
2. Confirmations
3. Training and Development
4. Compensation reviews
5. Competency building
6. Improve communication
7. Evaluation of HR Programs
8. Feedback & Grievances

**Methods of Performance Appraisal**

There are numerous methods in use to appraise employee performance depending upon the size and nature of the organizations. A common approach to assess performance is to use a numerical or scalar rating system whereby managers are asked to score an individual against a number of objectives/attributes.

In some companies, employees receive assess-

ments from their manager, peers, subordinates, and customers, while also performing a self assessment. The most popular methods used in the performance appraisal process can be divided in two categories:

Traditional methods

Modern methods

Traditional methods include, Ranking methods, Graphic Rating Scale method, Critical Incidents Method, Checklist Methods, Essay Method and Field Review Method.

Modern Appraisal methods include, Management by Objectives, 360 – Degree Feedback Appraisal, Behaviorally Anchored Rating Scales, Assessment Genre, Human Resource Accounting, and Balanced Scorecard.

**Objective of the Study**

To study the performance appraisal activities in Banks of Jagdalpur.

To find out helpfulness of appraisal program in employee's performance.

To study the effectiveness of motivation program in Banks.

Identification of the techniques of performance appraisal followed in Banks.

To determine the satisfaction level of the employees.

To provide suggestions and recommendations from the study

**Research Methodology**

Sample Size:-

The Researcher has proposed to interview the respondents who were working in various banks in Jagdalpur and they were selected as the sample for the study.

Sources of data:-

The study is based on both primary and secondary data.

**Primary Data**

The primary data were collected through structured questionnaire.

Basically there are two types of sampling first; is Census sampling and secondly; Random sampling as it is not possible for us to go through all the people in Jagdalpur so we have opted for Random sampling the sample size taken for this project is 100 respondents were given questionnaire to be filled and response was given by them. I did the data analysis and Interpretation of the data collected and on that bases project conclusion is made.

**Secondary Data**

The required secondary was collected from books, magazines and websites and other publication available in the college library.

Data collection Technique:-

The questionnaire has been designed and supplied to the respondents for collecting primary data from the employees.

**Limitations of the Study**

Gathering information to conduct the survey was a problem because the respondents were usually busy and had difficulty finding time to complete the questionnaire.

Many people were less interested to fill the questionnaires.

Respondents were not aware of the topics.

Respondents were not ready to disclose their bank's information and personal information. Following Banks did not permit to do research on their banks:

-Punjab National Bank.
-Canara Bank.
-Bank of India.
-Bank of Baroda.

**Findings and Results**

**Q.1 Are you aware of the performance appraisal or any evaluation done by your superior**?

**Interpretation -**out of total respondents,95% of the respondents were aware of their performance appraisal/review done by their superior and only 5% of the respondents were unaware of any such activity.( see Table 1 and figure 1)

**Q.2 .Have you ever had performance appraisal/review since joining your bank?**

**Interpretation** -all the respondents had their performance appraisal/review since joining their respective Banks. .( see Table 2 and figure 2)

**Q.3 How often is your performance appraised or reviewed?**

**Interpretation -** Out of total respondents 7% of the respondents said that their performance is being appraised or reviewed every month,10% said,16% said half yearly and 67% of the total respondents said yearly. .( see Table 3 and figure 3)

**Q.4 Who conducts the performance appraisal in your bank?**

**Interpretation** -out of the total respondents 67% of the respondents that their performance is being appraised by their immediate superior.18% of the respondents said that rating committees appraise their performance and 15% of the respondents said that they are appraised through self ratings. . ( see Table 4 and figure 4)

**Q.5Which method of performance appraisal is implemented in your organization?**

**Interpretation -**Out of the total respondents 38%of the respondents said that their Banks use traditional method of performance appraisal.43%of the respondents said that their bank use modern methods of appraisal.6% of the respondents said 360 degree method of appraisal is being used.7%of

the respondents said that both modern and traditional method of appraisal is being used by their banks. And 6%of the respondents were unaware of any such methods. .( see Table 5 and figure 5)

**Q.6. What kind of reward do you get after appraisal?**

**Interpretation -**Out of the total respondents 37% of the respondents said that they get monetary reward after appraisal.38% of the respondents said that they get non monetary rewards after appraisal.12% of the respondents said that they get both monetary and non-monetary rewards after appraisal. and 13% of the respondents said that they don't get either of the rewards. .( see Table 6 and Figure 6)

**Q.7. Which is the most effective method of appraisal in your opinion?**

**Interpretation -**Out of the total respondents 29%of the respondents are of the opinion that traditional method is the most effective method of performance appraisal.37% of the respondents said modern methods and 34%of the respondents said 360 degree method of appraisal is most effective. ( see Table 7 and Figure 7)

**Q.8. Do you think performance appraisal helps people set and achieve meaningful goals?**
**Interpretation -**100% respondents believe that performance appraisal helps them to achieve meaningful goal. ( see Table 8 and Figure 8)

**Findings**

- Out of the total respondents,73% of the respondents worked in public banks and only 27% of the respondents worked in private banks.
- Most of the respondents were aware of the performance appraisal activity carried out in their respective banks.
- Almost all the respondents had their performance appraisal/review since joining their respective banks.
- Mostly public sector banks carry out performance appraisal of the employee yearly whereas private banks carryout performance appraisal activity more often , like half yearly or quarterly.
- In most of the banks immediate superior is the evaluator or appraiser of the employee. Few banks also have the system of rating committees.
- Most of the respondents were aware of the methods used in performance appraisal.

- Most of the public banks use the traditional methods of appraisal on the other hand most of the private banks use modern methods of appraisal.
- Out of traditional methods, rating scale technique is the most popular one, followed by ranking technique and confidential report system.
- Out of modern methods, HR accounting is the most preferred technique of appraisal followed by MBO process and customer feedback method.
- Most of the banks provide their employees with both monetary and non-monetary rewards after appraisal.
- Almost all the respondents want to have the system of self rating.
- Majority of the respondents feel that a modern method of appraisal is the most effective method of appraisal.
- Performance appraisal helps in setting up of goals, improves motivation and job satisfaction. It also improves the performance of the employee
- 52% of the respondents feel that PA has affected their morale and 48% of the respondents were not affected by the PA.
- Credibility of the appraiser does affect the PAS.
- Majority (83%) of the employees perceive the PA activity of their bank as develpomental.Few (12%) respondents perceive it as judgmental.
- About 85% of the respondents are satisfied with the appraisal system of banks where as 15% of the respondents are not satisfied.

**Suggestions**

- Banks should introduce a separate HR department to take care of the employees.
- Appraisal of performance should be done on the basis of achievements made by the employee in respect of internal and external environment and not on the basis of top management target.
- In public banks, PAS is generally based on rating scales. It is conducted mostly for promotions. It has a role but restricted one. It never figures out what is lacking in an employee and how it should be further improved therefore performance appraisal should be conducted in such a way that it improves an employees performance.
- The complaints channel has to be made more effective and functional. It should provide a satis-factory reply to the employee's complaints in time. And should take all the necessary actions.
- In public Banks performance appraisal should be conducted more often and frequently. Public banks should also adopt modern methods of appraisal other than the conventional ones.

- Performance appraisal should be carried out positively with intentions to bring out best in employees.
- Banks should provide both monetary and non-monetary rewards to the employee from time to time as these rewards act as the biggest and most effective motivators.
- Employees should be imparted knowledge and information regarding the process, methods and techniques of performance appraisal system.
- Employees should be given an opportunity to rate themselves.
- Assessment should not be confined to past performance alone. Potentials of employee for future must be assessed.

**Conclusion**

In this project " A study on employee's performance appraisal system of Banks in Jagdalpur city", the questionnaire methodology was adopted and the employees working in both Private and Public sector bank were contacted in order to know about the performance appraisal system of their respective Banks. The area of the study was restricted to Jagdalpur and only 100 respondents were selected.

After completing the survey I got to know about the importance of HR management in an organization and performance of an employee being the most important factor in the further development of an employee and organization

It is clear that both type of methods i.e. tradional method and modern method are used in banks for appraisal purpose..

Motivating good employees in the Banks requires more than just thinking for banks to remain competitive it has to be reality and for that reality to be implemented the linkage of performance appraisal with the motivation of the employees is essential.

It is found that the average age group of trainees are in their twenties or early thirties which signifies that the consumer durable industry need more of young blood as enthusiasm is an integral part of the industry.

**Bibliography**

Performance Appraisal is taken from the Internet and from the book "Human Resource Management". Profile of the Bank is taken from Wikipedia.org.

# Tables & Figures

Table-1

| | |
|---|---|
| Yes | 98 |
| No | 2 |

Figure -1

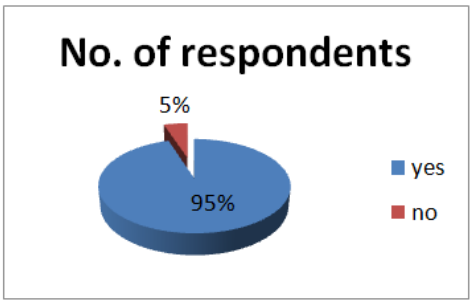



**Table -2**

| | |
|---|---|
| yes | 100 |
| no | 0 |

Figure -2

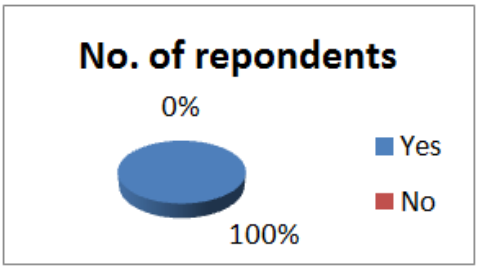
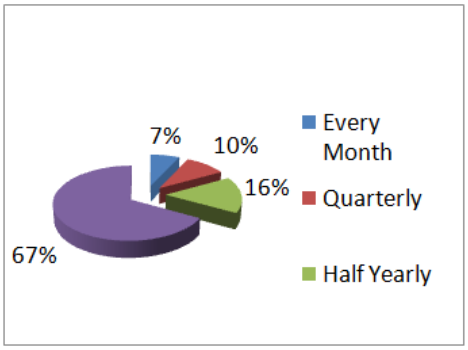



**Table-3**

| Time | No. of Respondents |
|---|---|
| Every Month | 7 |
| Quarterly | 10 |
| Half Yearly | 16 |
| Yearly | 67 |

**Figure - 3**



# Tables & Figures

Table- 4

| Who conducts the performance appraisal in your bank | No. of Respondents |
|---|---|
| Immediate superior | 67 |
| Peer appraisal | 0 |
| Rating Committees | 18 |
| Self Rating | 15 |
| Appraisal by sub Ordinate | 0 |

Figure-4

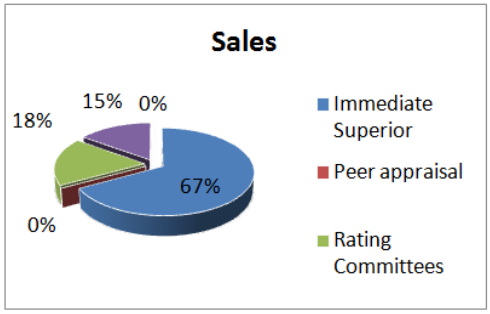



Table- 5

| Methods | No. of Respondents |
|---|---|
| Traditional methods | 38 |
| Modern methods | 43 |
| 360 degree methods | 6 |
| Both traditional and Modern | 7 |
| Unaware | 6 |

Figure- 5

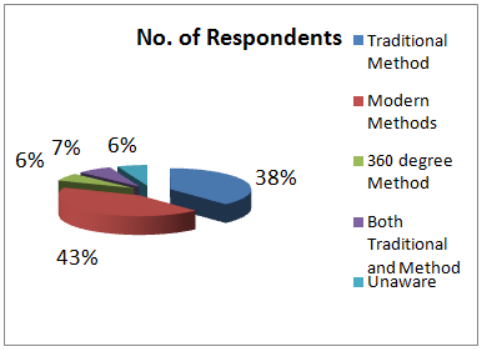
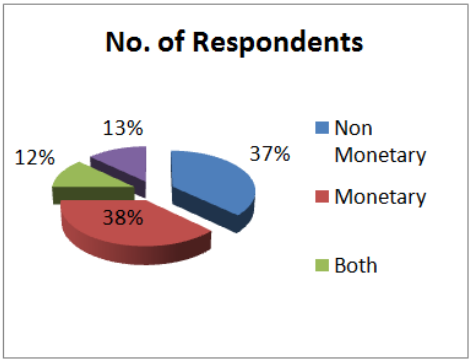



Table- 6

| Reward | No. of Respondents |
|---|---|
| Non monetary | 37 |
| Monetary | 38 |
| Both | 12 |
| None of the above | 13 |

Figure- 6



# Tables & Figures

Table-7

| Response | No. of respondents |
|---|---|
| Traditional method | 29 |
| Modern method | 37 |
| 360 degree method | 34 |

Figure -7

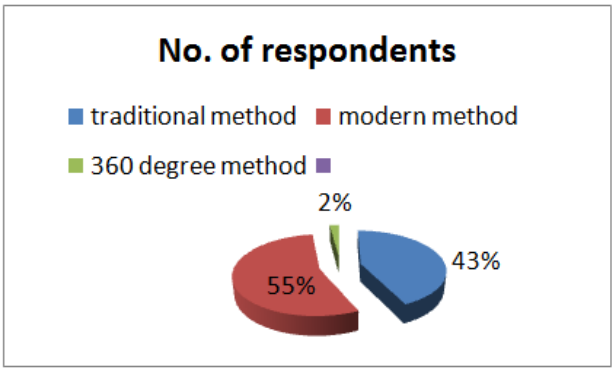
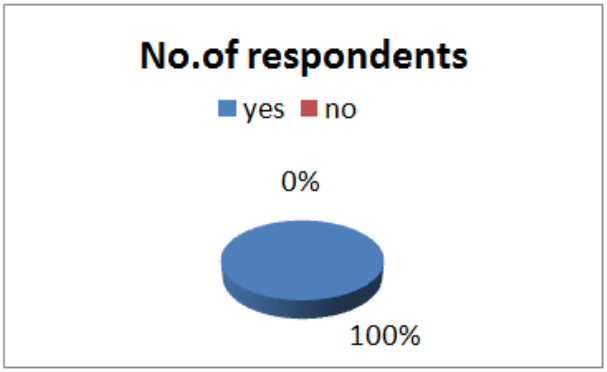



Table-8

| Response | Respondents |
|---|---|
| Yes | 100 |
| No | 0 |

Figure-8



# बच्चन काव्यभ "प्रकृति"–प्रेरणा एवं रूप विधान

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**सारांश**

*प्रकृति रूप विधान के अन्तर्गत है। कविता और प्रकृति परस्पर पूरक हैं। कवि की कोमल भावनायें–प्रेम तथा श्रृंगार आदि की अभिव्यक्ति में प्रकृति की महत्तवपूर्ण भूमिक रही है। यह प्रकृति वस्तुतः रूप विधान पर आधारित है। जो रूप विधान कविता की आत्मा को योग दे, भावों को मूर्त रूप देने में जहां तक समर्थ हो सके वहीं तक उसकी सार्थकता है अन्यथा वह श्रृंगार का बाह्य प्रसाधन मात्र बनकर रह जाता है।*

*हिन्दी काव्य में प्रकृति एक शक्ति के रूप में जानी जाती रही है। कविवर पंत ने "देवि सहचरी मम प्राण" कहकर प्रकृति के प्रति सम्मान एवं निष्ठा का भाव व्यक्त किया है।*

**प्रस्तावनाः–**

प्रकृति रूप विधान के अन्तर्गत है।कविता और प्रकृति परस्पर पूरक हैं।कवि की कोमल भावनायें प्रेम तथा श्रृंगार आदि की अभिव्यक्ति में प्रकृति की महत्तवपूर्ण भूमिका रही है। यह प्रकृति वस्तुतः रूप विधान पर आधारित है। जो रूप विधान कविता की आत्मा को योग दे, भावों को मूर्त रूप देने में जहॉ तक समर्थ हो सके वहीं तक उसकी सार्थकता है अन्यथा वह श्रृंगार का बाह्य प्रसाधन मात्र बनकर रह जाता है। ब्लिस पेरी का कथन है कि "कविता का दूसरा नाम रूप विधान है और रूप विधान का इन्द्रिय राग से घनिष्ठ संबंध है।कविता इंद्रियों के माध्यम से पदार्थों को स्पष्ट करती है और बोध–गम्य बनाती है, किन्तु उसकी जानकारी नहीं देती। अतः हम कह सकते हैं कि रूप विधान का निर्माण शब्दों से नही होता बल्कि वह तो इंद्रियानुभूति मात्र है।"**1**

**कविता का सौंदर्यः–**

कविता का सौन्दर्य नवीन रूप विधान, नये रूपक और नये उपमानों से निखर उठता है, क्योंकि प्राचीन रूप विधान तथा प्रतीक निरंतर प्रयोग के कारण काफी घिस जाते हैं जिनमें अर्थ वहन करने की क्षमता प्रायः कम हो जाती है। किन्तु रूप विधान का संबंध अंतरंग से अधिक और बहिरंग से कम होना चाहिए।

कवि जिस विषय को अपने पाठकों या श्रोताओं के समक्ष उपस्थित करना चाहता है उसके प्रति उसकी स्वतः एक निष्ठा अनुभूति या भावना होती है। वह स्वयं उस विषय से निष्ठा एवं भावना ज्यों का त्यों किसी दूसरे के हृदय में संक्रान्त कर देता है।

सौन्दर्य–विधायिनी कल्पना के सहारे कविता का असंभाव्य कृत्रिम रूप संभाव्य प्राकृत रूप में बदल जाता है।

"अलंकार के नव विधान में इसका आंशिक रूप प्रकट होता है,किन्तु पूर्णरूप समान प्रभाव उत्पन्न करनें में है।केवल अलंकार की रक्षा में प्रयत्नशील रूपक,उत्प्रेक्षा आदि के प्रयोग में इसका माधुर्य नष्ट हो जाता है किन्तु प्रभाव की तीव्रता,गंभीरता और स्थायित्व अंकित करने के प्रयास में अलंकार विध

ाान कल्पना का अंग बन अभिनव सौन्दर्य की पूष्टि करता है। छायावादी कविताओं में कल्पना के इस रूप का विशद चित्र उपस्थित किया गया है।"2

**कविता और रूप विधानः–**

आचार्य रामचंद्र शुक्ल ने रूप विधान की तीन कोटियां की है।:–

- प्रत्यक्ष
- स्मृत
- कल्पित रूप विधान

काव्य में यह नितान्त आवश्यक नहीं की रूप साम्य के लिए आकार प्रकार में सम्पूर्ण समानता हो अथवा धर्मसाम्य के लिए गुण की पूरी समानता दोनों पदार्थों में समान रूप से ही विद्यमान रहे।सादृश्य बिम्ब प्रतिबिम्ब रूप और साधर्म्य –वस्तु–प्रतिवस्तु धर्म दोनो ही काव्य मे भाव व्यंजकता में सहायक होते हैं।"3

"बच्चन" ने 'मधुशाला' में नारी का रूप चित्रण करते समय प्राकृतिक उपादानों का आश्रय लिया है। जिस ध्वनि को कवि पहचानता है,जिस पग के तलवे की लाली नंदन वन में उगने वाली मेंहदी की लाली सदृश है।

"यह चांद उदित होकर नभ में,
कुछ ताप मिटाता जीवन का
लहरा–लहरा कर शाखायें
कुछ शोक भूला देता मन का।"4

"कहते हैं,तारे गाते हैं।
सन्नाटा वसुधा पर छाया,
नभ में हमने,कान लगाया,
फिर भी अगणित कंठो का यह राग नहीं हम सुन पाते हैं,
कहते है तारे गाते हैं।
स्वर्ग सुना करता यह गाना,
पृथ्वी ने तो बस यह माना,
अगणित ओस कणों में तारों के नीरव आंसू बहते हैं।5

बच्चन काव्य में प्राकृतिक रूप विधान अपनी विशेषताओं के साथ विद्यमान है।

अति प्राचीन काल से ही बहुओं की लाज की मर्यादा को बनाये रखने के लिए उन्हें डोली में बैठाकर एक स्थान से दूसरे स्थान तक ले जाने की प्रथा चली आ रही है।

रूप–विधान एक नन्हा सा शब्द चित्र है जिसका उपयोग कवि अथवा लेखक अपने भावों एवं विचारों की व्याख्या करके उसे बोधगम्य और स्पष्ट करने के लिए करता है।

"अप्रस्तुत रूप विधान उपमा, रूपक उत्प्रेक्षा, संदेह, भ्रांति, अपन्हुति, दीपक, अप्रस्तुत(प्रशंसा) आदि सादृश्य मूलक अलंकारो के रूप में आता है और लक्षण अलंकारो के रूप में आता है।सिद्ध कवियों की दृष्टि से ही अप्रस्तुतों की ओर जाती है जो प्रस्तुतों के समान ही सौन्दर्य,दीप्ति,कांति,कोमलता,प्रचंडता,भीषणता,उग्रता, उदासी,अवसाद खिन्नता आदि की भावना जगाते है।"6

**बच्चन की प्रारंभिक कृतियों में वैयक्तिक अनुभूति में रूप विधानः–**

बच्चन की प्रारंभिक कृतियों में वैयक्तिक अनुभूतियों का तीव्र दर्शन उन्हें मधुशाला में बहका ले जाती है। हिन्दी काव्य जगत में हालावाद का यह स्तर नितान्त नवीन था। हाला का मादक प्रभाव कम होते–होते बच्चन जी "एकांत संगीत" "निशा–निमंत्रण" तथा "सतरंगिनी" जैसी कृतियां लेकर प्रस्तुत हुये जिनमें वस्तु–चित्रण के साथ रूप–चित्रण भी अपनी पराकाष्ठा पर पहुॅचा हुआ है। यद्यपि इन रचनओं में कहीं–कहीं स्थूल चित्र के नाम पर मांसलता उभर गई

है,किन्तु इनका कलात्मक दृष्टि–कोण कहीं भी पराजित नहीं हुआ।बच्चन जी की यह प्रवृत्ति आदि से अन्त तक एक ही दिशा में भावर लेती रही है,वह प्रवृत्ति है प्रेम और निराशा की।

छायावाद की सूक्षम आध्यात्मिक ॲधियारी, पकड़ में न आने वाली अशरीरी सौन्दर्य कल्पना तथा सूक्ष्म, ऐन्द्रियता के विरूद्ध जो स्वर उठे उनमें अंचल, बच्चन तथा नरेन्द्र के स्वर अधिक मुखर हुये।

"इन पुकारों की प्रतिध्वनि,
हो रही मेरे हृदय में,
प्रतिच्छायित जहां जहां पर, सिंधु का हिल लोल–कंपन।
तीर पर कैसे रूकूं मैं,
आज लहरों में निमंत्रण।"7

"ढोलक ठनके,
रूठी मन के
रूठे प्रियतम के द्विग बिहैसे
घन बरसे।"8

इस प्रकार बच्चन काव्य में प्राकृतिक रूप–विधान अपनी विशेषताओं के साथ विद्यमान है।

बच्चन जी की मधुशाला में कतिपय सांस्कृतिक उपकरण मिलते हैं,जिनके माध्यम से कहीं–कहीं खंड चित्र बन जाते हैं,किन्तु विशेषतः ये मिलाप ही करते हैं। निम्नलिखित पंक्तियों में खंड चित्र प्रस्तुम किया गया है।

"बने पुजारी प्रेमी माला गंगा जल पावन हाला
रहे फेरता अविरल गति से मधु के प्यालों की माला।
. मंदिर हो यह मधुशाला।"9

पुजारी मंदिर में बैठकर इष्टदेव के नाम की माला जपता है। इसमें पुजारी,गंगाजल और मंदिर की अवतारणा करके एक सांस्कृतिक वातावरण तैयार किया गया है।पुजारी पर साकी का, गंगाजल पर हाला का, माला पर मधु के प्यालों का,तथा मंदिर पर मधुशाला का आरोप करके एक संश्लिष्ट चित्र का आयोजन किया गया है। कवि का आशय यहां हाला और मधुशाला का गुणगान करना रहा है। जिसके लिए उपर्युक्त सांस्कृतिक उपादानों का आश्रय लिया गया है।

वस्तु स्थिति का चित्रण करके सांस्कृतिक परम्परा का निर्वाह निम्नलिखित पंक्तियों में काफी सफलता के साथ किया गया है।

"मेरे अधरों पर हो अंतिम वस्तु न तुलसीदल प्याला
मेरी जिह्वा पर हो अंतिमवस्तु न गंगाजल हाला
मेरे शव के पीछे चलने वाली याद इसे रखना
"राम नाम है सत्य" न कहना,
कहना सच्ची मधुशाला"10

हिन्दु संस्कृति के अनुसार मरते समय मुंह में गंगाजल तथा तुलसी की पत्ती डाल दी जाती है। ये दोनों वस्तुयें अपनी पवित्रता के लिए प्रसिद्ध हैं। यहां हाला और प्याला के माध्यम से उसी वस्तुस्थिति का भान कराया गया है। कवि परम्परा विहित परिस्थितियों का कायल नहीं है। वह अंतिम समय में अधरों पर प्याला और हाला रखना चाहता है और शव के पीछे चलने वालों को "सच्ची मधुशाला" कहने का आदेश देता है। इस कथन से चित्र नहीं बनता है। इसमें मनुष्य को उस स्थिति का भान होता है, जब वह मृत्यु के समीप पहुॅच गया है, और पूरे परिवार के लोग परम्परा का पालन करते हैं।

कवि उसी प्रकार अगली पंक्ति में भी

"सांस्कृतिक परम्परा के निर्वाह का ही चित्रण करता है।वह कहता है कि मेरी चिता पर घृत का नही शराब का पात्र उड़ेला जाय और घट को अंगूर की लता से बॉधा जाय जिसमें घी के बदले हाला हो और श्राद्ध करते समय ब्राह्म्णों को न खिलाकर पीने वालों को बुलाकर मधुशाला का दरवाजा उनके लिए खोल दिया जाय।"11

हिन्दू संस्कृति में शव को जलाने से पूर्व चिता में काफी मात्रा में घी डाला जाता है, तत्पश्चात पेड़ की डाल से घट (जल से भरा एक मिट्टी का पात्र जिसके पेंदे सें पानी टपकता है) बांधा जाता है। जिसमें जल भर दिया जाता है। ऐसा विश्वास किया जाता है कि बूंद–बूंद कर, टपकने वाला जल मृतक व्यक्ति के मुंह में जाता है। नौ दिन तक यह घट पेड़ से बंधा रहता है, दसवें दिन उसे वैदिक रीति से तोड़ दिया जाता है और उन–उन वस्तुओं का दान किया जाता है जिसका उपयोग मृतक व्यक्ति अपने जीवन–काल में करता था। तेरहवें दिन श्राद्ध किया जाता है, जिसमें ब्राहम्णों को भोजन कराया जाता है।

यही दृश्य इन पंक्तियों में साकार हो उठा है।यद्यपि किसी अप्रस्तुत का विधान नहीं किया गया है,फिर भी "बच्चन" ने अपनी स्थिति का यथार्थ चित्र खींचने में सफलता पाई है। उसी प्रकार का चित्र इन पंक्तियों में मिलता है–

"जब निज प्रियतम का शव रजनी तम के चादर से ढक देगी।"12

किन्तु यहॉ प्राकृतिक उपकरणों के माध्यम से सांस्कृतिक चित्र प्रस्तुत किया गया है।रजनी अपने प्रियतम का शव तम रूपी कफन से ढॅक देती है। तात्पर्य,यह कि संसार में तब अंधेरा ही अंधेरा हो जायेगा।इसी भाव को व्यक्त करने के लिए शव और चादर की कल्पना की गई है। प्रकाश के विनाश और अंधकार के आगमन का चित्र इन पंक्तियों में स्पष्ट हो जायेगा।

**निष्कर्ष**

अतः स्पष्ट है कि बच्चन काव्य में प्रकृति चित्रण के विविध पक्ष अपनी अपनी समग्रता के साथ उपथित हैं, उनमें माधुर्य, कमनीयता, सरलता, सहजता एवं विश्वसनीयता के गुण विद्यमान हैं।

**सहायक संदर्भ ग्रंथों की सूची**


- Perry Bliss- A study of poetry p-48
- पाण्डे राम खिलावन–काव्य और कल्पना पृष्ठ.19
- लक्ष्मी नारायण (मृद्यांशु) काव्य में अभिव्यंजनावाद पृष्ठ. 97
- बच्चन 'सोपान' पृष्ठ.39
- बच्चन लहरों का निमंत्रण
- आचार्य शुक्ल रामचंद्र हिन्दी साहित्य का इतिहास पृष्ठ .808
- बच्चन लहरों का निमंत्रण
- बच्चन चार खेमें चौसठ खूँटे (वर्षामंगल)
- बच्चन सोपान पृष्ठ.23
- बच्चन सोपान पृष्ठ.29
- बच्चन सोपान पृष्ठ.30
- बच्चन सोपान पृष्ठ.57

# CUSTOMER SATISFACTION WITH REFERENCE OF HDFC STANDARD LIFE INSURANCE- A STUDY

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**Abstract**

*Customer satisfaction continues to be one of the most important topics in insurance companies. Consequently, theorists are continuing to explore new models and methods that may unlock meaningful information about customer satisfaction. This study was conducted on in various parts of Raipur city who had taken policies. This study was done through the being asked to fill up the questionnaires which were specifically designed to find out their satisfaction level towards the insurance policies of HDFCSLIC. The company deals with varieties of policies like individual products, group products, social products and rural products. The company has number of customers. The research design used for this study is descriptive research. The data were collected on both primary and secondary data. The sample size of the study is 150 customers used to this study. Data analysis was carried out and findings are listed down. Suitable suggestions have been provided and hope it's useful for the company. This study revealed that the most of them are satisfied with the policies they have taken and there are certain who were not comfortable with the company policies. The company should take these into consideration and have to improve where they are weak.*

**KEY WORDS**: *Customer Satisfaction, Customers.*

## INTRODUCTION

In today's increasingly competitive environment, quality services and customer satisfaction are critical to corporate success. Delivering high quality services is closely linked to profits, cost savings and market share. As stated by Piercy (1995), it is striking that one of the few elements that links many of the otherwise disparate recommendations made to managers over the past several decades has been the need to focus on customer satisfaction as a route to sustained high performance. Companies should, to a much higher degree, be aware of the fact that customer dissatisfaction equals both defection and long-term losses. As stated by various authors (Ballantayne *et al.* 1996; Berry, 1986; Collier, 1994; Schneider and Bowen, 1995): It is easier - and much cheaper - to keep existing customers than to get new ones. Additionally, another benefit from achieving satisfied customers is the fact that the willingness to repurchase is much higher for satisfied customers than for dissatisfied and indifferent ones. Despite this awareness concerning the importance of customer satisfaction, it is beyond the ability of many of today's service companies to maintain satisfied customers.

## NEED OF THE STUDY

This study would enable HDFC-SLIC to identify the customer satisfaction towards their products (i.e.) life insurance policies. This study is very necessarily needed to fulfil their customer requirements. Secondly it is to enhance the business development and also to provide the extra services to their. It is to understanding the feelings regarding their products and also to know the comments regarding their products. Finally to understanding the customer behaviour which has to determine the various in place of Raipur.

## SCOPE OF THE STUDY

The main purpose of this study is to know the customer satisfaction level among of HDFC SLIC .To know the reason for purchasing the other policies to develop market competency and better ways of customer satisfaction. To know the reason for preferring the HDFC SLIC's insurance products. To know the market position of the various products. This study will help to identify the satisfaction level .

## OBJECTIVES OF THE STUDY

1. To know the on customer satisfaction level of life insurance policies of HDFC standard life insurance company in Raipur.
2. To find out the complaints or grievances against the products of SLIC.
3. To find out the reach ability of the products in and around people of life insurance policies
4. To determine satisfactory level towards the features and characteristics of the product offered.
5. To find out whether they are satisfied with various types of premiums and methods of premium payments.

## RESEARCH METHOLODOGY

### Primary Data And Secondary Data

The primary data was collected by a survey. The data is collected from the customers by direct interview method with the use of structured questionnaire. The secondary data is collected from the internal records of the company and library references. It includes company information, etc.

## SAMPLING

The total sample size compressing 150 customers of HDFC SLIC. A random sample is one chosen by a method involving an unpredictable component.

## FINDINGS

From the study it is inferred that 22% are satisfied, 30% are highly satisfied with the service provided to the customer , 24.6% of are dissatisfied and 23.4% customers are highly dissatisfied,30% are satisfied and 25.3% are Highly satisfied on operating mode ,23.3% of customers are dissatisfied and 21% of customers are highly dissatisfied on operating mode ,22% of the customers are satisfied and 33% of the customers are highly satisfied on product information, 23%

are dissatisfied and 21% of the customers are highly dissatisfied on product information. 30% of the customers says that they are highly secured , 25%f the customers says that they are secured,23% of the customers says that they might be secured in HDFC SLIC,21% of the customers says that they have no idea. From the research it is inferred that 45% of the customers are interested in joining as financial consultant in and rest 55% of customers are not interested in joining as financial consultant .From the study it is inferred that 52% of customers accepted that HDFC is having enough no of branches near by their residential areas and 48% of customers didn't accept. It is inferred that 52% of the customers says that they know HDFC SLIC is having various modes for paying premium and 48% of the customers says that they don't know HDFC SLIC is having various modes for paying premium. It is inferred that 27% of the customers said very good about SDM,19% of the customers said good about SDM,20% of the customers said neither good or bad,17% of the customers said poor about SDM and 18% customers said very poor about SDM.

## SUGGESTIONS

It is suggested that the company communicates new plans and policies introduced through news letter and mails to the customer. Employees must be trained to give the information and help provided by the company. The company must take steps to improve the benefits and returns of the policies and implement schemes which are more beneficiary. Whenever they have doubt there must be 24/7 support and must be met directly even if they are in long distance so that they get close interaction with the employees and belief in the company and the company policies. Effective advertisement can increase the product awareness towards the public and also increases the sales volume of the product.

## CONCLUSIONS

The study on customer satisfaction of HDFC SLIC is a great useful to the company. They come to know the areas of improvement and areas where they are really good. HDFC SLIC is having good brand image in midst of the Raipur people. More over most of the HDFC SLIC are satisfied with the service rendered to them. They understand the needs of the customer and they act according to that so that each and every customer can be satisfied. This study is a great helpful to company. This study gives me a good practical knowledge and also helps to know the reaction. They are the back bone for every business. So their requirements have to be fulfilled. HDFC SLIC too is trying to satisfy most of the customer. If they follow the suggestions given in the study it will be a great useful to build a good customer relationship and can be the no 1 insurance company in India.

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