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MANIFOLD ACCESSIBLE SEGMENTATION BASED NARRATIVE DESIGN IN CLOUD COMPUTING FOR DATA PUBLISHING

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ABSTRACT

Distributing Data is a simple and cost-effective way for data sharing, but the confidentiality threat is a key anxiety in data publishing. One of the problems in such practices is how to trade-off between data utility and privacy protection. The problem seriously depreciates when the published data are used to do cluster analysis. The paper establishes a narrative progression known to be "Manifold Accessible Segmentation (MAS)". The technique utilizes to accomplish conserves enhanced data effectiveness than simplification and can be used for relationship confession safeguard. The method allocates the approval of assorted data utility metrics for dissimilar information removal tasks. Another important benefit of segmentation is that it can hold high-dimensional data we design a new method integrating sampling and generalization to implement the model. Our workload experiments confirm that MAS preserves better utility than generalization. Our experiments also demonstrate that MAS can be used to prevent membership disclosure.

KEYWORDS: Data Publishing, Data Segmentation, MAS, Manifold Accessible Segmentation & Cloud Computing

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Original Article

INTRODUCTION

Nowadays, progresses in modern tools include direct to an enhancement in the potential to store and trace private data regarding users and folks. The has lead to anxiety that the personal data may be distorted for a range of intentions. In order to improve these concerns, a number of methods have just been projected in regulate to achieve the data publishing responsibilities in a privacy-preserving way [1]. An assignment of the extreme significance is to extend techniques and tools for distributing data in a more intimidating situation, so that the available data ruins almost constructive although entity privacy is conserved. The responsibility is called privacy-preserving data publishing (PPDP) shown in the figure 1.In earlier days[1] [2]; explore district have react to the dispute and proposed many schemes. Whereas the examiner field is unmoving rapidly increasing, it is a high-quality instance to converse the statement and enviable possessions for PPDP, illuminate the dissimilarity and necessities that differentiate PPDP from other associated problems, and methodically review and estimate unusual approaches to PPDP. The review intends to realize these purposes.

Discharging data to the community or other social gathering for research is a predictable development and has significant remuneration to the corporation and the public. Conversely, such behavior have been robustly conflicting by their consumers since the unrestricted data frequently include their perceptive data and by distributing data openly, will abuse users' confidentiality [3]. Thus users dispute that their security of reliability would be imposed and the privacy problem has been hoisted with mounting significance today. The activity is in

the possibility of privacy preserving data publishing (PPDP).

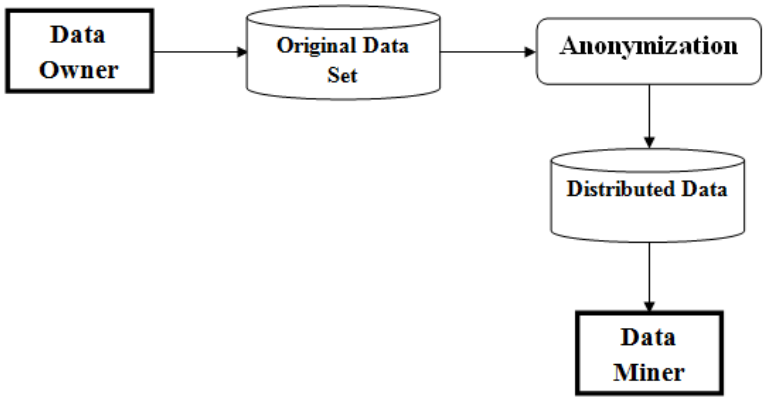

Figure 1: Simple PPDP Model

A distinctive PPDP situation is illustrated in the above figure. Suppose Thee is a centralized belief server well-known to be data publisher, who has a gathering of data from consumers and desires to discharge the together data to a data miner or to the unrestricted for study or other purposes [4] [6]. A task of the utmost importance here for the data owner is to anonymize information ahead of it being distributed such that the data receiver cannot find out the isolation data about users whereas still obtain significant data and carry out data mining actions in a respectable exactness. One insignificant Anonymization [5] process is that previous to dataset to be unrestricted, user names and IDs are restoring with arbitrary records or basically unconcerned. Conversely, The variety of slight anonymization is not superior sufficient to defend users' confidentiality. Personal or responsive user information can motionless be extracted from the enduring user data, so identified as re-recognition.

In The paper, we will try to find solutions to the privacy and user contour anonymization crisis that precise to suggested scheme, which do not escort to exposé of personality information, but conserves the informational content as greatly as potential. The paper includes of two components, a conjectural part where The will consider special approaches of user profile anonymization process and spot their recompense and shortcomings. In The component of effort, a revise of the situation of ability must be completed in which contender approaches will be evaluated. Meanwhile, after gaining knowledge about existing methods, The is believed to move toward with a enhanced result or construct expansion of accessible techniques. The concept of resistant is handled in second division is a realistic element where is necessary to execute The novel algorithm and confirm the conclusion of the speculative studies with The obtainable information sets. The research, privacy-preserving data publishing, is a study of preventing The kind of linking attack. [8] Its goal is to prevent linking some record holder to a specific (or a small number of) data record and sensitive information in the released data although, at the equal time, protecting the useful information in the released data. The paper identifies a collection of privacy threats in various real life data publishing problems, and presents a unified Segmentation algorithm for removing these threats. Details of the algorithm will be given in the paper.

The Manifold Accessible Segmentation algorithm, the user can now utilize it in anonymization of a horizontally circulated dataset to attain privacy illustrated in figure 2. In The phrase, the user will present a baseline algorithm, and then The algorithm that operates a data owner responsive algorithm with adaptive confidentiality inspection approach to make certain high effectiveness and security for anonymized data. The algorithm first generates all possible splitting points, π, for QI attributes and data providers. Apart from the multidimensional QI area gap, The regard as the data publisher or data

resource of every evidence as an further aspect of every record, represented as A.Establishing The supplementary attribute in The multi-dimensional space appends a innovative aspect for separation. The directs to other divides resultant a new accurate analysis of the data and has an undeviating impact on the anonymized data effectiveness. To locate the prospective split spot along The dimension, The can enforce an entirety organize on the source. The scheme supervise that The multi set-based simplification is the equivalent to a insignificant segmentation scheme where each feature encloses accurately one aspect, since both approaches preserve the accurate standards in each attribute but crack the relationship between them within one probable split point. The system detects that as per-column Segmentation conserves attribute distributional information, it does wipe out attribute association, for the motivation that each attribute is in its own column. In segmentation, one groups associated attributes together in one column and save their correlation.

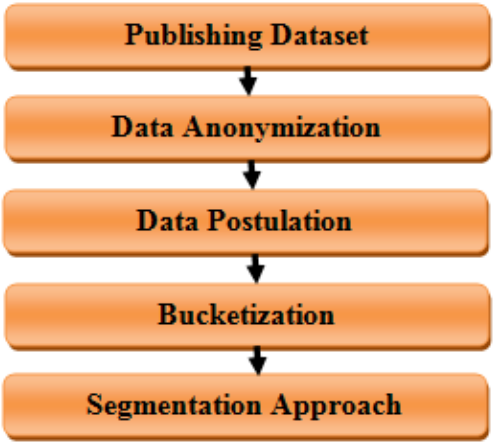

Figure 1: Manifold Accessible Segmentation (Mas) Architecture

Releasing the data analysis or data mining result such as a classifier, instead of the data, could be an option if the data publisher knows exactly how the data miner may analyze the data. The information, however, often is unknown at the moment of release [9][10]. For example, in visual data mining, the data recipient needs to visualize data records in order to produce a classifier that makes sense, and in the k-nearest neighbor classification the data itself is the classifier. In these cases, releasing data records is essential. In other cases, some classifiers are preferred for exactness, some for average precision, various for interpretability, and however some for definite domain definite properties. The data publisher does not have the proficiency to make such assessments for the data recipient due to the requirement of field facts and complicated data mining techniques. Publishing the data provides the recipient a greater flexibility of data analysis.

PROBLEM DEFINITION

Information assessment is the development of extorting concealed projecting data from outsized quantity of datasets. The investigation can be achieved by the data publisher or the data owner can contract out the data assessment to further parties. In some case, the confidentiality unease of the implicated persons should be deal with and measured at all periods [7] [8]. The mutual data distributing difficulty for anonymizing straight separation of data at several data sources a novel kind of insider molest by scheme data publisher who might utilize their possess data reports in addition to the outer conditions information to conclude the data records supplied by further data publisher [11].

- The concept of confidentiality, which assurance that the anonymized data suits a given isolation limitation against any collection of up to m planning data publishers.

- The heuristic algorithms utilizing the uniformity grouping monotonicity of confidentiality restraints and adaptive organizing methods for proficiently inspecting privacy given a position of proceedings.
- A data owner responsive anonymization algorithm with adaptive m-privacy examination approaches to make certain elevated convenience and confidentiality of anonymized data with effectiveness. Researches on real-time datasets recommend that the approach reaches enhanced or equivalent effectiveness and competence than obtainable and baseline algorithms even as given that privacy assurance.

Thee are numerous problems in presented privacy preserving Data Publishing method

- The drawback of completely assuming that each sensitive attribute takes values uniformly over its domain; that is, that the occurrences of the different standards of a private quality are comparable. When The is not the case, attaining the necessary intensity of confidentiality may basis a massive data effectiveness defeat.
- Several techniques preserves against susceptible element exposé by allowing for the sharing of the characteristics. The approach involves well characterized standards in each combination of quasi-identifiers. The can be complex to accomplish and, like responsive k-anonymity, might outcome in a huge data effectiveness loss.

It would significantly injure the utility of information since inflicting familiarity destroys the associations among quasi-identifier attributes and responsive attributes.

EXISTING SYSTEM

In general in privacy protection Thee is a lack of safety. The confidentiality shielding is not possible suitable to the existence of the attackers environment knowledge in actual living application. Data in its unique type restrains responsive information about persons [12]. The information when shared abuses the privacy. The existing perform in data sharing relies essentially on strategy and plan as to what kinds of knowledge can be published and on accords on the use of published data. The scheme only can direct to unnecessary data deformation or inadequate defense. Privacy-preserving data publishing (PPDP) [13] affords techniques and utensils for distributing functional information whereas protecting data privacy. Several algorithms like bucketization, generalization have aims to safeguard privacy but they reveal attribute exposure. So to overcome The problem an algorithm MAS is used.

Limitations of Existing System

- Presented anonymization algorithms preserve be used for column generalization.
- Data analysis like query responding techniques can be simply used on the sliced data.
- Existing confidentiality actions for association revelation protection consist of differential privacy and existence.

PRIVACY PRESERVING DATA PUBLISHING ISSUES

Due to the quick development of knowledge, the difficulties for data set and publishing enhance penetratingly. An enormous amount of information is used for study, information and calculation to locate away common prototype or standard which is valuable to public improvement and individual growth [15]. For the moment, intimidation emerge when terrific data accessible for the public. For instance, public can mine privacy data by receiving mutually secure-outward data; Therefore, Thee is a large prospect revealing persons confidentiality. According to the research, just about 87 % of the residents of the United States can be exceptionally recognized by known dataset available for the public. To keep away

from The position getting of poorer quality, actions are taken by protection department of various countries, for example, propagating privacy [14]. The constraint for data provider is that information to be published should well for the predefined situation. Recognizing attribute requirements to be misplaced from published information to assurance that person's privacy cannot be contingent from dataset openly. Eliminating identifier feature is now the research work of data processing, some refinement actions require to be through further. On the other hand [16], after data processing, it could reduce data efficacy considerably, although, data confidentiality did not obtain entirely conserved.

In face of the challenging risk, some researchers have been projected as a preparation of The embarrasses condition, which objective at achieving the stability of data effectiveness and knowledge privacy when circulating dataset. The enduring explore is known to be Privacy Preserving Data Publishing (PPDP) [17] [18]. In the earlier period, authorities have taken up the dispute and accepted a bunch of explorers. Several reasonable approaches are planned for special privacy protecting development, which explain the problems in PPDP efficiently. Novel schemes and hypothesis move towards constantly in experts' attempt to entire privacy preserving.

The data publisher can be divided into two categories. In the untrusted form, data owner is complicated who is further expected to expand privacy from data information. In the confidence form, data owner is trustworthy and any information in their supplies is protected and without some possibility. [20] Due to the dissimilarity of data distributing situations affected by untrustworthy statements and necessities to data publisher, data receivers intentions and other aspect, it provides four developments for extra completed conversation that maybe emerge in actual privacy preserving data publishing. The primary situation is the non-expert data provider. [23] In The situation, data publisher does not require to have particular information about research fields. The second one is the data receiver might be an attacker. [21] The scenario is other generally established and numerous projected clarifications construct it as the essential hypo paper. The third aspect is the publish data is not the data sharing result. It specifies that dataset offers by data provider in The scenario is not simply for data mining. Finally, truthfulness at evidence stage [19]. Data owner must assurance the dependability of information to be published whatever handing out methods will be used. Therefore, randomization and perturbation cannot congregate the necessities in the situation.

MANIFOLD ACCESSIBLE SEGMENTATION

Establishing The supplementary feature in The multi-dimensional liberty includes a new aspect for detachment. The directs to more splits resultant a new accurate analysis of the information and has a straight contact on the anonymized data usefulness. To locate the probable crack point along the element, can enforce a whole regulate on the contributors. The observe that The multi set-based generality is the same to a insignificant segmented scheme where every column encloses precisely one feature, since the approaches protect the accurate values in each attribute but divide the involvement among them inside one probable crack point. The monitors that even as one-column-attribute Segmentation conserves attribute distributional knowledge, it does demolish feature association, for the motivation that each characteristic is in its possess column. In segmentation, one set related attributes simultaneously in one column and keep their association.

- **Data Anonymization**

The Anonymization of data is a knowledge that transfers comprehensible text into a non-human understandable format. Data Anonymization method for PPDP has established a collection of consideration in modern years. Complete data encloses information regarding a person or a society. Most admired Anonymization techniques are Generalization and

Bucketization. There are number of features in each report which can be classified as:

- The social security number is the feature that can be distinctive spot out the person is known to be Identifiers.
- Sensitive Attributes are referred to some attributes like disease and salary
- Some Identifiers are taken together to represent an individual called Quasi-Identifiers.

Data is measured anonymized still when conjoined with pole or derivation values that express the consumer to the initiates scheme, record, and assessment and when anonymized accounts can be related, coordinated, and/or conjoined with further anonymized reports. Data Anonymization permits the relocates of knowledge transversely a limit, such as among two sections within a society or among two actions, although dropping the threat of inadvertent confession, and in assured situations in a behavior that permits assessment and analytics situation Anonymization. The two methods vary in the subsequently pace. Simplification alters the QI-values in all bucket hooked on a smaller amount detailed except semantically dependable values Therefore that tuples in the equivalent bucket cannot be illustrious by their QI values. In Bucketization, one splits the SAs from the QIs by arbitrarily permitting the SA values in every bucket. The anonymized information consist of a collection of buckets with permuted perceptive feature values.

- **Postulation**

Postulation is one of the commonly anonymized approaches, which changes quasi-identifier values with values that are a lesser amount of explicit but semantically dependable. At that moment, every quasi-identifier values in a collection would be global to the complete set scope in the QID hole. If at least two communications in a set have separate values in a definite column, then all knowledge regarding that entry in the present group is misplaced. The QID used in The development consist of all probable objects in the log. Appropriate to the high-dimensionality of the quasi-identifier, among the quantity of achievable items in regulate of thousands, it is possible that several generalization technique would acquire enormously soaring data loss, depiction the data inadequate. In categorize for generalization to be valuable, records in the identical bucket have to be secure to all other so that generalizing the tuples would not drop moreover large amount information. On the other hand, in high-dimensional information, the majority data spots have related reserves with each other. To achieve data investigation or data mining responsibilities on the general table, the data forecaster has to construct the identical allocation statement that each value in a generalized time/set is regularly probable, as no other sharing assumption can be reasonable. The considerably condenses the data effectiveness of the generalized data. And too since each feature is generalized independently, links among unusual attributes are misplaced. In sequence to revision attribute associations on the generalized table, the data analyst has to presume that each probable permutation of feature values is uniformly achievable. The is an inbuilt difficulty of simplification that avoids efficient investigation of attribute relationships.

- **Bucketization**

The earliest, who term bucketization, is to separation the rows in T into buckets, and subsequently to split the responsive attribute since the non-sensitive ones by indiscriminately permuting the susceptible feature values contained by each bucket. The disinfected information after that consists of the buckets with permitted susceptible values. The paper [4] uses bucketization as the process of creating the available data from the unique table T, even if every result seizes for complete field generalization as fine. Now denote the concept of bucketization further properly. Separation of the tuples into buckets, and in each bucket, The concerns an self-sufficient arbitrary combination to the feature including S-values.

The resultant collection of buckets, represents by B, is then shared.

A micro data usually contains various further attributes moreover individuals' three attributes. The means that the relationship knowledge of nearly all individuals can be conditional from the bucketized table. Second, bucketization needs a understandable partition among QIs and SAs. Though, in various data collections, it is indistinct which attributes are QIs and which are SAs. Third, by unscrambling the perceptive feature from the QI attributes, bucketization splits the attribute associations involving the QIs and the SAs. Bucketization initially splits tuples in the table into buckets and then detaches the quasi identifiers with the sensitive feature by erratically permuting the susceptible attribute values in all buckets.

- **Segmentation**

To enhance, the present situation of the ability in the paper, initiate a novel data Anonymization technique called **Segmentation**. Segmentation detachment the data situate both vertically and horizontally. Vertical separation is completed by alignment attributes into features supported on the correlations between the attributes. Each column includes a division of attributes that are extremely associated. Horizontal separation is prepared by combining tuples into buckets. At last, inside each bucket, values in every column are indiscriminately sorted to crack the involving between special columns. The fundamental suggestion of Segmentation is to break the relationship annoyed columns, but to protect the association restricted by every column. The decreases the dimensionality of information and conserves enhanced utility than generalization and bucketization. Segmentation preserves effectiveness since it assembles extremely interrelated attributes collectively, and preserves the association between such attributes. Segmentation cares for confidentiality since it cracks the associations among uncorrelated features, which are irregular and consequently recognizing. Notices that while the data set enclose QIs and one SA, bucketization has to break its correspondence; Segmentation, on the other hand, can cluster various QI attributes with the SA, defending attribute relationship with the responsive attribute. The key perception that Segmentation offers privacy security is that the Segmentation progression makes sure that for whichever tuple, Thee are normally several corresponding buckets. Segmentation initially partitions attributes into columns. Every column includes splits of attributes. Segmentation also separates the tuples into buckets. Surrounded by each bucket, values in every column are erratically permutated to split the relating between unusual columns.

IMPEMENTATION METHODOLOGY

The technique performs the extensive assortment workload research. The results are established that Segmentation conserves a lot improved data efficacy than the generalization. In these relating the sensitive feature, Segmentation is also supplementary capable than bucketization. In various categorization researches, the novel technique i.e. Segmentation shows better performance than the original. A value is restored by a reduced amount of detailed, other common value that is accurate to the unique. In Figure 3, the actual pin codes {12343, 12358} can be generalized to 123**, thus striping the rightmost numeral and semantically representing a superior area.

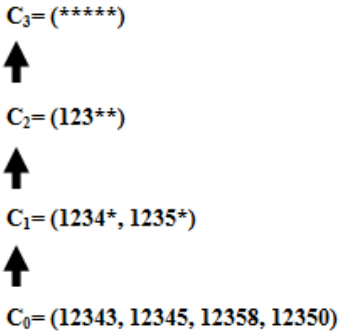

Figure 3: Data Anonymization

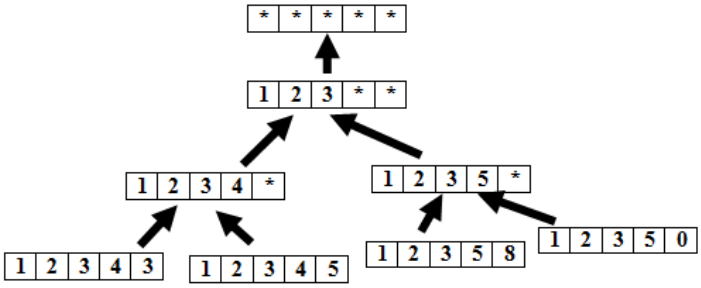

Figure 4: Data Postulation

In a traditional relational record system, areas are used to illustrate the position of values that attributes believe. For instance, Thee strength is a pin code domain, a quantity domain and a sequence field. The paper expands The concept of a domain to formulate it easier to portray how to simplify the values of an attribute. In the actual database, where each value is as explicit as probable, all attribute is measured to be in a position domain.

Segmentation Algorithm

A lot of algorithms like bucketization, generalization have attempted to protect privacy but they reveal attribute confession. So to defeat The difficulty an algorithm called Segmentation is used. The algorithm consists of three segments: Multi-set Element Separation, Column Postulation and Segmentation Dataset.

- **Multi-Set Element Separation**

The algorithm separates attributes so that extremely interrelated attributes are in the equivalent column defined in Table 3. The is superior for mutually effectiveness and privacy. In provisions of data efficacy, combination exceedingly associated attributes conserves the associations with those attributes. In terms of privacy, the relationship of uncorrelated features presents privileged classification threats than the involvement of highly interrelated attributes since the associations of uncorrelated attribute values is greatly fewer recurrent and so more individual.

Table 1: Postulation Table

Age	Gender	Pin Code	Occupation
[25-45]	*	1234*	IT Officer
[25-45]	*	1234*	Business
[25-45]	*	1234*	Clerk
[50-65]	*	1235*	Business
[50-65]	*	1235*	Business
[50-65]	*	1235*	Clerk

- **Column Postulation**

While column postulation is not an essential stage, it can be functional in some aspects. Initially, column postulation could be necessary for characteristics confession protection. If a column value is exclusive in a column, a tuple with The inimitable column value can simply have one identical bucket. The is not excellent for privacy protection, as in the casing of generalization/bucketization where every record can fit in to only one similarity bucket. The key trouble is that the exclusive column value can be acknowledged. As shown in Table 2, in The case, it would be constructive to affect column postulation to make certain that every column value emerges with at least various occurrences. When column postulation is useful, to realize the equivalent intensity of privacy next to attribute revelation, bucket sizes can be lesser. Whereas column postulation could product in information loss, smaller bucket-sizes permit improved data utility. Thus, there is a trade-off among column postulation and segmentation.

Table 2: Column Postulation

Age	Gender	Pin Code	Occupation
25	M	12343	IT Officer
35	F	12343	Business
25	F	12348	Clerk
55	M	12358	Business
55	M	12350	Business
60	M	12353	Clerk

The observe that The multi set-based generalization is the identical to a insignificant Segmentation scheme where all column surrounds closely one attribute, since both approaches safeguard the accurate values in each attribute however crack the relationship among them inside one bucket.

Table 3: Multi-Set Element Separation

Age	Gender	Pin Code	Occupation
25:2, 35:1	M:1, F:2	12343:2,12348:1	IT Officer
25:2, 35:1	M:1, F:2	12343:2,12348:1	Business
25:2, 35:1	M:1, F:2	12343:2,12348:1	Clerk
55:2, 60:1	M:3, F:0	12358	Business
55:2, 60:1	M: 3, F:0	12350	Business
55:2, 60:1	M: 3, F:0	12353	Clerk

- **Segmentation Data Set**

A furThe significant benefit of segmentation is its ability to hold high-dimensional information. By dividing attributes into columns, segmentation condenses the measurements of the data. Each of which column of the table 4 can be viewed as a sub-table with a lesser dimensionality. Segmentation is also not similar from the approach of publishing multiple independent sub-tables in that these sub-tables are related by the buckets in segmentation.

Table 4: Segmentation Table

(Age, Gender)	(Pin Code, Occupation)
(25,M)	(12343, IT Officer)
(25, F)	(12343, Business)
(35, F)	(12348, Clerk)
(55, M)	(12358, Business)
(55, M)	(12350, Business)
(60, M)	(12353, Clerk)

The algorithm sustains two data configuration: 1) a queue of buckets Q and 2) a collection of segmentation buckets SB. Originally, Q encloses simply one bucket which contains all tuples and SB is empty. For each execution, the algorithm eliminates a bucket from Q and cracks the bucket into two buckets. If the segmentation table behind the crack suits l-diversity, then the algorithm sets the two buckets at the conclusion of the queue Q If not, The cannot divide the bucket any longer and the algorithm puts the bucket into SB. When Q turns into empty, The has divided the segmentation table. The set of segmentation buckets is SB.

PERFORMANCE EVALUATION

The Performance evaluation of The narrative technique MAS gives the better when compared with existing anonymization techniques in the field of data publishing. The privacy preserving in data publishing is the major aspect is handled effectively with The technique. The figure 6 depicts the precision average for the MAS which is response to the recall.

Table 5:Evaluation Table

Performance Metrics	K-Anonymity	Bucketization	Overlapping Slicing	MAS(Proposed)
Response Time	Acquires more responding time	Require more time for high dimension data	More responding time in high dimension	Need less response time in both high dimension and probable distribution
Data Utility	More amount of element would be violated	Loss of Data Utility	Utility was not achieved	Data utility is enhanced
Privacy	Local Anonymization ensure for privacy	Local Anonymization for Privacy	Global Anonymization ensured	Ensure Global Anonymization for Privacy
Accuracy	High correlation among the records	Evaluating similar approach on k items	An attribute is duplicated in more than one columns	Sensitive attributes are Randomized
Efficiency	Deliberated in more amount of data	Lack in high dimension data set	Ensure efficient Sliced data	Provide efficient data in better manner
Information Gain	Information gain was not clear	Not Clear in high dimension data	High dimension data is unclear	Better information Gain is acquired

The above table 5 illustrates the performance evaluation for the existing methods with the proposed method MAS that provide better outcome for MAS in all performance metrics.

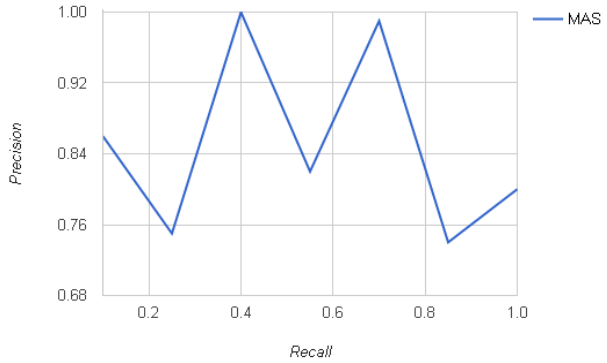

Figure 5: Average Precision

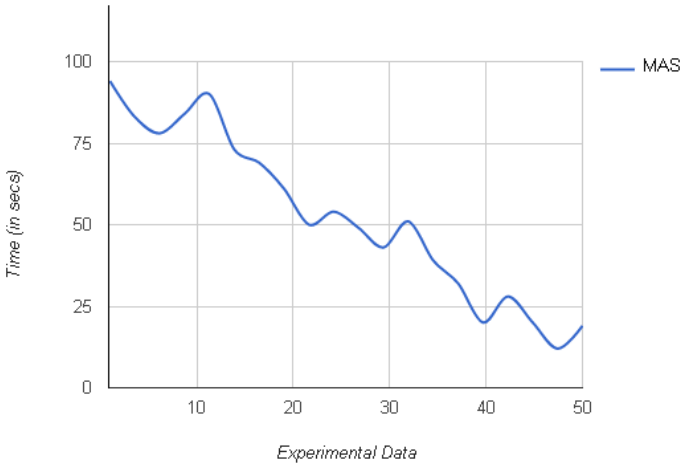

Figure 6: Performance Chart

Figure 7, defines the performance chart in the basis of computational time for various set of experiential data set which acquires less time consumption for the data set. The figure 8 illustrates the optimization ratio for segmented data set for the data publishing which provides good results as compared other methods. The figure 9 depicts the accuracy ratio for the various methods and the proposed method MAS which gives better accuracy than the other techniques.

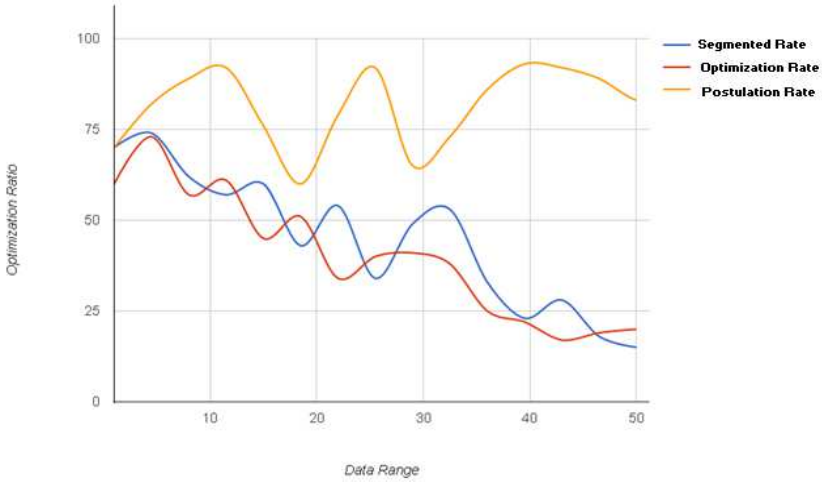

Figure 7: Optimization Ratio

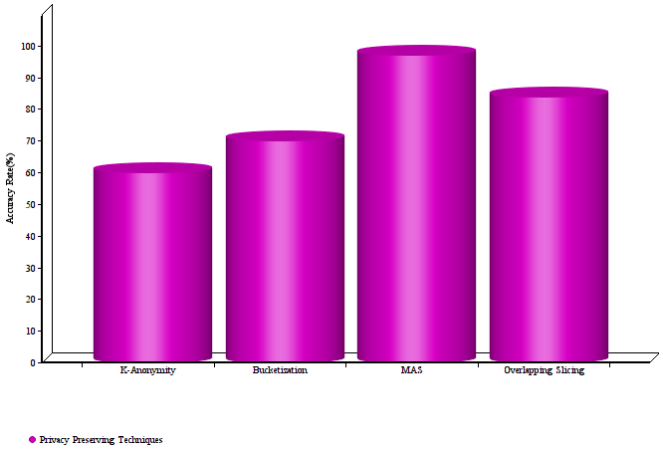

Figure 6: Accuracy Ratio

CONCLUSIONS AND FUTURE ENHANCEMENT

A novel data segmentation technique called MAS is used to improve the current state of the art. Segmentation partitions the collection of data both vertically and horizontally. Multi-dimensional break appends a novel aspect for separating. Segmentation defeats the restrictions of generalization and bucketization and conserves enhanced utility even as defending next to seclusion threats. Segmentation avoids characteristic exposé and relationship confession. We regard as segmentation where every aspect is in accurately one column. An expansion is the concept of be related Segmentation, which reproduction an attribute in furThe than one column. Our researches illustrate that casual combination is not very valuable. We map to propose more useful tuple grouping algorithms. An additional path is to intend data mining responsibilities using the anonymized data calculated by assorted Anonymization techniques.

Segmentation defends confidentiality by breaching the relationship of uncorrelated attributes and protect data utility by preserving the involvement between highly correlated attributes. Another important advantage of slicing is that it can handle high-dimensional data. To put it simply, the role of privacy preserving data publishing is to transform the original dataset from one state to the other state so as to avoid privacy disclosure and withstand diverse attacks.

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