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FVI-BD: Multiple File Extraction using Fusion Vector Investigation (FVI) in Big Data Hadoop Environment

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Abstract— The Information Extraction (IE) approach extracts useful data from unstructured and semi-structured data. Big Data, with its rising volume of multidimensional unstructured data, provides new tools for IE. Traditional Information Extraction (IE) systems are incapable of appropriately handling this massive flood of unstructured data. The processing capability of current IE systems must be enhanced because to the amount and variety of Big Data. Existing IE techniques for data preparation, extraction, and transformation, as well as representations of massive amounts of multidimensional, unstructured data, must be evaluated in terms of their capabilities and limits. The proposed FVI-BD Framework for IOT device Information Extraction in Big Data. The unstructured data has cleaned and integration using POS tagging and similarity finding using LTA method. The features are extracted using TF and IDF. The Information extracted using NLP with WordNet. The classification has done with FVI algorithm. This research paper discovered that vast data analytics may be enhanced by extracting document feature terms with synonymous similarity and increasing IE accuracy.

Keywords-Big Data, FVI, IE, TF-IDF, Unstructured Data, WORDNET, IOT.

I. INTRODUCTION

Information Extraction eliminates functionally ordered data from formless data represented as objects, relations, items, processes, and other things. With the help of data extraction, unstructured data may be made ready for analysis. In this way, improved data analysis is a direct result of the IE process's accurate and speedy translation of unstructured data. Multiple strategies have been developed for text, image, audio, and video data types. In recent years, Technological Innovation has accelerated the rise of data volume. The capabilities of the computing paradigm have been modified by volume, diversity (organized, unorganized, and semi-organized data), and velocity of large data. According to IBM, more than 4.5 billion bytes of information are created every day. Amongst these statistics, it can be expected that unorganized data from sources would increase to 90% over many years. According to IDC, unorganized data will account for 96% of universal data, with 66% as the growth rate per Anum [1]. Unstructured data has the following qualities in common: it comes in various forms such as text, audio, video, websites, and image [2–5]. (ii) Lack of schema owing to non-standardization [3–4] (iii) it is derived from several sources such as clouds, social media, and sensors. Due to the vast quantity and complexity of unstructured data, collecting useful information from diverse data sources has become a time-consuming process. Information Extraction (IE) work's fundamental contribution is two-fold. First, a comprehensive assessment of current methodologies for IE subtasks for every information type, namely text, picture, audio, and video, is performed. Belerao and Chaudhari may use the information that has been rigorously collected and synthesized for each data to grasp the notion of IE, its subtasks, and cutting-edge approaches. Second, the IE research taxonomy is intended to discover and categorize unstructured data in a significant data context. There are two primary categories of problems: task-related and data-related challenges. Lastly, IE improvement model aims to solve the limitations encountered in prior IE solutions for big multidimensional unstructured data [9].

Daily, the IOT device digitalized and networked world generates enormous quantities and varieties of Big Data (organized, disorganized, and semi-organized) the architecture of big data is shown in figure 1. Unstructured data is the most

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crucial since it lacks a defined data model and structure, making it difficult to handle, manage, and store. The pace of expansion of unstructured data is far higher than that of structured data. Unstructured data will comprise 95% of the digital world, and it double every two years [10]. IE from data types is difficult owing to unstructured data concerns.

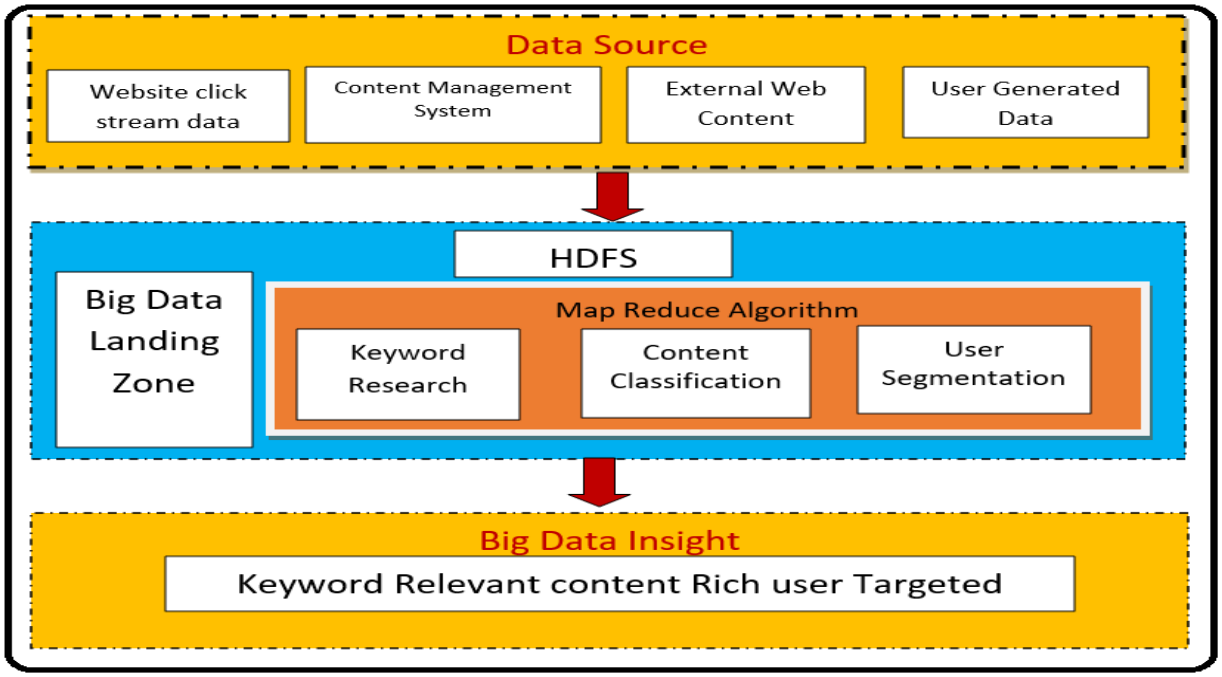

Figure 1: General Architecture of Big Data

Tuarob, Bhatia, Mitra and Giles [11] proposed an indexing idea to speed up the search process. Each database item is allocated a unique index that is unique to each tuple. The elements are sorted in a specified order depending on certain characteristics determined using the specific index. The indexes may be created at no extra cost. Today, many Big Data projects are centered on the 3V issues. However, Big Data's success depends not only on the promised answers to the 3V difficulties but also on the security and privacy concerns in Big Data analytics. The notion of Big Data will not be broadly adopted until the security and privacy issues are solved.

Similarly, when Big Data is used in a smart grid, a utility provider may gather data from users in a residential area every 15 minutes to develop conservation programs that assess current consumption to estimate future demand. Although this kind of Big Data analytics might help the energy business gain a competitive advantage, the near-real-time data created every 15 minutes may be exploited to reveal consumers' personal information. More importantly, Big Data analytics are rendered ineffective [11].

The process of automated IE from unstructured data gives up new avenues for strengthening its processing and administration. In this context, the study highlights the IE process challenges associated with unstructured data to optimize performance problems. This paper suggests improving the performance of IE from unstructured data by using the FVI method. The main contributions are included in this paper as follows

- The IOT device unstructured data has cleaned and integration using POS tagging
- Similarity finding with LTA method.
- The features are extracted using TF and IDF.
- The Information extracted using NLP with WordNet.
- The classification has done with FVI algorithm

The rest of the work is organized as follows: Section 2 reviews briefly the IE methodologies and techniques for extracting different types of data from unstructured data. In section 3, the recommended methodology is described in depth, section 4 discusses about experimental result of proposed work, and section 5 provides the conclusion.

II. BACKGROUND STUDY

Ahmad, Zobaed, Gottumukkala and Salehi [1] a cloud computing-based system that provides user-focused search capabilities on massive encoded data in the cloud. The design included a use tier, an edge tier, and a cloud layer. It provides real-time search over enormous quantities of encoded data by narrowing the search zone and studying just relevant data clusters. The edge tier uses the user's searching mechanism for

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accurate pruning and generates dynamic samples for each cluster. This sign calculates the number of objects in each abstract and occupies it with words that qualitatively describe themes in the relevant cluster. To assess the cropping quality authors compared the suggested framework to the one utilized in the search engine and navigation of searching mechanism

Belerao and Chaudhari [2] using the Map-Reduce architecture, an alternative structure for creating an interesting layout from a big social event of data was provided. The approach uses an open-source Java framework for extracting semantic similarity words and remembering a specific objective to identify any topic data from a multitude of reference points in a Big Data-determined network. Customers will no longer have to manually scrutinize each document. All theories will be immediately accessible.

Bian, Jiang and Chen [3] LDA Model leads to the distribution of writings by subject and the assignment of terms to topics. This study, as shown by the constructing sentence cycle, the identification of topic-criticality, and topic-dissemination, presents an alternative sentence-situating method for achieving the marvelous character of sentences.

Chiranjeevi, Manjula Shenoy, Prabhu and Sundhar [4] presented a search engine based on high-performance text document retrieval based on a profound structured semantic method and a novel text hashing approach. To measure the retrieval of text documents by using a distributed system and main memory, this employs powerful computation techniques such as text hashing provides the best-enhanced performance, and assessment, and demonstratesthe importance of large data and data analytics. The model's higher layer employs the semantic vector illustration to help documents and queries match semantically search requests.

Lomotey and Deters [6] with current business transactions, it is apparent that "Big Data" is here to stay. This is because the bulk of traditionally paper-based stock market transactions is becoming electronic. Furthermore, the number of end-user-delivered materials throughout the several scopes of the endeavor scene is increasing at an alarming pace. While Big Data offers vast ideal conditions, heterogeneous data (i.e., collecting) poses additional obstacles.

Leung, MacKinnon and Jiang [7] a tree-based method that uses Map Reduce to mine enormous uncertain data for frequent patterns that fit user-specified criteria, as opposed to computing all frequent patterns. This saves time and space. That's why our software only displays useful patterns to shoppers. In addition, the authors briefly examined how our technique deals with anti-monotone (AM) constraints, even though their primary emphasis was on SAM restrictions.

Ragavan [8], an essential aspect of Key-Hash indexing with ranking was that the result retrieve time could not be changed much in the situation of concurrent queries. Key-Hash indexing may also benefit from a distributed design. The wiki-based ranking algorithm was a distinct module that had no link to the crawler side and could be completed fast and without any effort. To minimize the amount of room needed to store the massive amounts of data necessary for in-depth searches, it save them in binary format. Since disc accesses for bin files during runtime are much quicker than for regular files, bin files are loaded into RAM relatively quickly. This whole process aided search engines greatly in efficiently indexing and ranking vast amounts of material.

Kotturu and Kumar [9] Argue that modern education has evolved dramatically in terms of teaching methods and other factors. Many adjustments were going place to implement a huge revolution to keep conventional schooling unmodified. Some nations, such as England and the United States, have increased the value of education by incorporating new elements into the current scenario practically, in this topic. Whatever the scenario, there are certain privacy and legal phrases that arise as a result of technology. All of these things are different from one country to the next. Europe has been reluctant to embrace Big Data because they fear their information would be compromised if it is uploaded to a server located outside of the region. After ensuring that people's personal information is secure, society must analyze demographic data such as their level of education, income, etc.

Tuarob, Bhatia, Mitra and Giles [11] Algorithms are crucial for tackling research issues. There are a large number of such high-quality algorithms created by seasoned scientists and published in scholarly journals. Extracting and categorizing these algorithms in digital libraries would enable a variety of intriguing uses, such as algorithm searching, discovery, and analysis. There are many drawbacks to unstructured IE, so it implement IE in a more efficient method of Data Extraction from Unstructured Data (DEUD).

A. Problem Definition

In Big Data has larger files in storage server. If the user can search any one of the document means the searching has delayed. And also the search cannot fetch the exact details from the server. It use the FVI-BD method for every user can search the data without any interruptions with highly accuracy. Here the FVI classification has done classification. For the SVM cannot execute very well when the data set has more sound. So the proposed the FVI algorithm with high accuracy.

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III. MATERIALS AND METHODS

Big Data is a massive trove of information that can be mined algorithmically for insights on phenomena of all kinds, notably human behavior and interaction. Users may access the data and get recommendations based on related data since it is kept largely in the Storage Center and the proposed architecture is shown in figure 2.

A. Data Set

In this research 1500 DataSets were experimented with various size. In this research proposed method is trained with benchmark DataSet such as collected from the web resource https://www.kaggle.com/datasets/saurabhshahane/spotgen-music-dataset and proposed method is tested by real time data set with various size. There are 524 files were used for training and 676 files were used for testing.

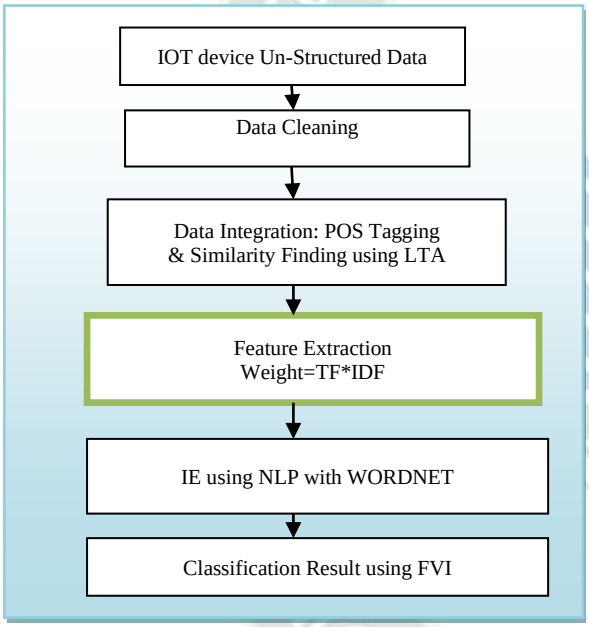

Figure 2: Architecture of Proposed System

B. Data Cleaning

Data cleaning is the process of identifying incompleteness, inaccuracies, or inappropriate data and then modifying or deleting it to enhance data quality [1]. Healthcare data, for example, is notoriously complicated and noisy due to its multisource and multimodal nature. The absence of values and the presence of contaminants in massive datasets also raise issues. Data quality drives information quality, which impacts decision-making, thus it's important to provide scalable, efficient data-cleansing procedures to enhance data quality for more informed, effective decision-making [8]. Despite the existence of a value, the missing value for a variable has not been included in the dataset [9]. Regularly, non-stochastic (or simple) imputation is utilized. One value is substituted for many missing values in a variable in simple imputation (mean, median, or mode). When there are moderate to large volumes of missing data, simple attribution may provide erroneous p-values for statistical tests, underestimated standard errors, and skewed connections between variables. For the most part, missing data problems may be solved without resorting to this technique [10].

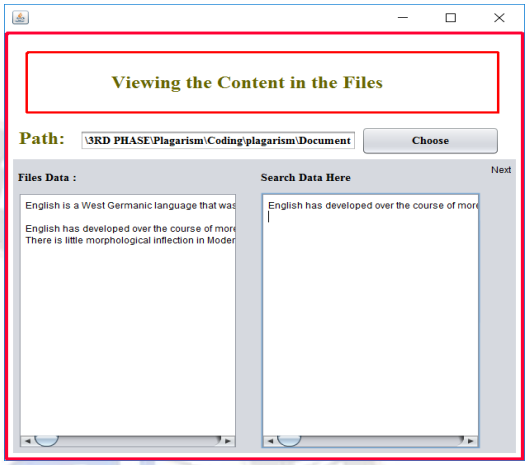

Figure 3: Searching Data for Particular Keywords

The end user can search the keyword and view the content in HDFS files is shown in figure 3.

The raw data has normalized by using data cleaning algorithm has shown in algorithm 1.

Algorithm 1: Data Cleaning Algorithm

```
Cleaning (Node x, entries set Z)
{U←x.unit;
If (x is a frond) {
        y*←the nearest point in Z to x.bit;
        y*.wgt←y*.wgtCent+x.bit;
        y*.counter←y*counter+1;
}
Else {
y*←the nearest point in Z to C's midpoint;
for each(d∈R\{v*});
if(|Z|=1) {
        y*wgt←y*.wgt+x.wgtCent;
        y*.Counter←d*counter+x.counter;
}
Else {
        Cleaning (x.left, Z);
        Cleaning (x.right, Z);
        }
}
}
```

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C. Data Integration

Latent Topic Analysis

LTA is a commonly used semantic indexing technique, a statistical approach for evaluating dual-mode with co-occurrence data. In this instance, three sets of variables were constructed to represent the data [18].

- Documents: d∈D = {d1. . . di} are pragmatic variables. Let i be the number of received documents as defined corpus size.
- Words: w∈W = {w1. . . wj}are observed variables. Let j represent the number of unique words in the corpus.
- Topic: t ∈ T = {t1… Tk} are Latent variables Where k was given in advance. Examining the general appearance (w, d) of a word or document

Subject modeling is a method for assigning topic keywords to record groups. The report's topic terms are the words that appear often. Before generating subject terms, stop words will be eliminated using part-of-speech (POS) tagging. The POS tagger assigns labels to each archived word. Stop words are the most often used terms in a certain language. Often regarded as stop words are articles and connection terms. The stop words will be labeled, and utilizing the labels, they will be erased and the result has shown in figure 4. After generating the subject terms, WordNet is used to generate the relevant semantic words.

WordNet [17] is an Application Programming Interface (API) capable of generating synonyms for a given term. These words' word weights are obtained using the TF-IDF approach. In this method, each word is given a score, and then the FVI classification algorithm is used to classify the words into related sets. One such method is the FVI distribution. The repository of shortened sentences is organized according to the subject words and the semantic comparative phrases. The yield record will offer a rough inventory of the papers collected and the semantic similarity has shown in figure 5.

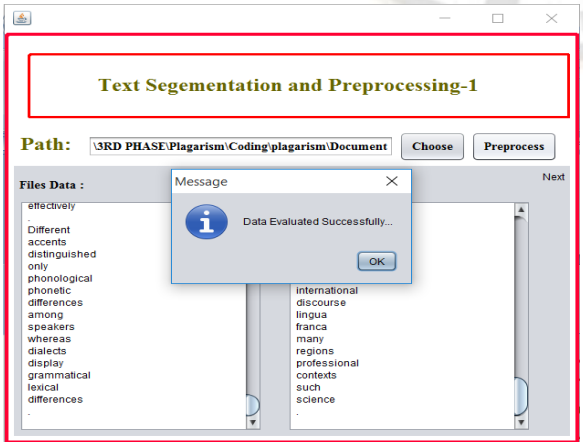

Figure 4: Data Segmentation and Preprocessing

D. Features-Based Extraction Method

This approach computes the sentence score based on criteria such as sentence-title similarity, number of unique phrases, named entities, numeric terms, keywords, positive and negative keywords, and TF-IDF value additionally, the sentence length. To find important sentences, the trait score is calculated and standardized in the range 0 of 1. A feature vector is created for each record and used to perform further calculations [20].

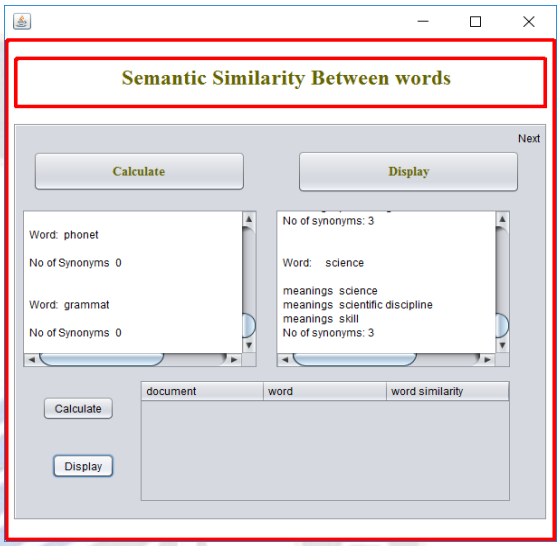

Figure 5: Similarity words Finding

Feature Extraction

a) Unique Term feature: Unique Term Features define the following data

- The number of distinct words in a phrase.
- The more individual words that appear in a sentence.
- The more important sentence from the Documents.

The Unique Terms Value is calculated by using

$$\text{Unique\_Terms\_Value} = \frac{\text{number of Unique Terms in the sentence}}{\text{number of Terms in the sentence}} \quad (1)$$

b) This indicates the degree of similarity between the word in the phrase and the title. As with the title used synonyms to capture word similarities in case another word was used. The more similar titles hold more importance to the sentence as it represents the subject of the document. The Title Similarity Score is calculated by

$$\text{Title\_Similarity\_Score} = \frac{\text{number of common Terms between headline and sentence}}{\text{number of Terms in a sentence}} \quad (2)$$

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TF-IDF Feature

This is the TF-IDF single-document version. Term frequency provides weights to the terms in the collection depending on their frequency of occurrence in the document. In contrast, the frequency of inversion decreases the weighting of the most frequent words, suggesting that they are less significant. Multiple papers use TF-IDF. The ISF indicates the frequency of reverse sentences and the word's occurrence inside the text. A term with a high IDF value is likely to appear often in sentences. These words are not crucial.

Term Frequency-Inverse Document Frequency (TF-IDF)

The TF-IDF is a vectorization technique for text-mining features [19]. As a consequence, the phrase's significance within the corpus will be redirected. Assuming t stands for the search term, d for the associated document, and D for the whole corpus. The TF sign, representing word frequency, shows how many times a phrase appears in a given text (t,d). The DF (t, D) notation for document frequency represents the true document count for the given time interval. It count all occurrences of "a," "the," and "of," and the frequency of those words will give more weight to the actual phrases in which the document's little information is accepted. Similarly, if a term is present across the corpus, the text is not communicating any new information. As a measure of how much information is contained in a given equation, the Inverse Document Frequency (IDF) is a useful tool (3):

$$\mathrm{IDF}(t, D) = \log \frac{|D|+1}{\mathrm{DF}(t,D)+1} \quad (3)$$

The sum of all documents in the corpus, denoted by |D|. For all words in the doc, IDF = 0. The TF-IDF will be used in the following formula to get the product of the TF and the IDF: (4):

$$\mathrm{TFIDF}(t, d, D) = \mathrm{TF}(t, d).\, \mathrm{IDF}(t, D) \quad (4)$$

There are two schools of thought in the field of language modeling, from which the TF*IDF was derived. One is that they are a privileged group, while another is that they are not. When evaluating a document using TF and IDF in a TF*IDF formulation, the word "elite quality" is also included. The significance of the word was calculated using this method. There are some problems with the representation in the text. The first is that, unlike many other statistical methods, TF*IDF is not based on any particular mathematical model. Shannon's theory explains why this is the case. The second argument against TF*IDF is that the size of the vocabulary for the whole dataset means that the dimensionality (size of the feature set) for a TF*IDF is equal, which might result in a very large number of computations involving the weighting of words.

The TF-IDF Score

It use the TF-IDF method to index the documents. A mash-up of the terms "term-frequency" (TF) and "inverse document frequency" (IDF) (IDF). It's the number of times a word appears in a text or set of documents divided by its total word count. Document ranks are also based on this weight. It's a crucial part of almost every Text Mining technique. Tokenization, stop-word elimination, and stemming are the first three steps in data pre-processing that are believed to have already been performed. Each document d is seen as a vector in the termspace, consisting of the terms that compose the document. Document d can be represented as,

$$\mathrm{dtf} = (\mathrm{tf}_1, \mathrm{tf}_2, \ldots, \mathrm{tf}_n) \quad (5)$$

The frequency with which a given phrase (TFI) occurs in a given text (d) is denoted by the variable td. Thus, the TF vector may accurately represent each phrase in the manuscript. Since document sizes are not uniform, it standardize the word frequency by dividing it by the total number of unique words in the text.

It is feasible to quantify the significance of a phrase in the corpus by using the inverse document frequency (IDF). The relevant value is the logarithm of the fraction obtained by dividing the total number of documents by the number of documents containing the phrase.

$$\mathrm{IDF}(t) = \log \frac{|D|}{|d:t \epsilon d|} \quad (6)$$

Where,

|D| - number of papers comprising the corpus

|d:tϵd| - number of papers containing the phrase t

If a phrase is absent from the corpus, division by zero will occur, thus to delete it.

adjust (1) by adding 1 to the denominator. i.e. 1 + |d:tϵd|.

Consequently, the TF-IDF score for a document word is now,

$$\mathrm{tf} - \mathrm{idf}(t, d) = \mathrm{tf} \times \mathrm{idf} \quad (7)$$

The word weight calculation has done with the formula (7) and the result has shown in figure 6.

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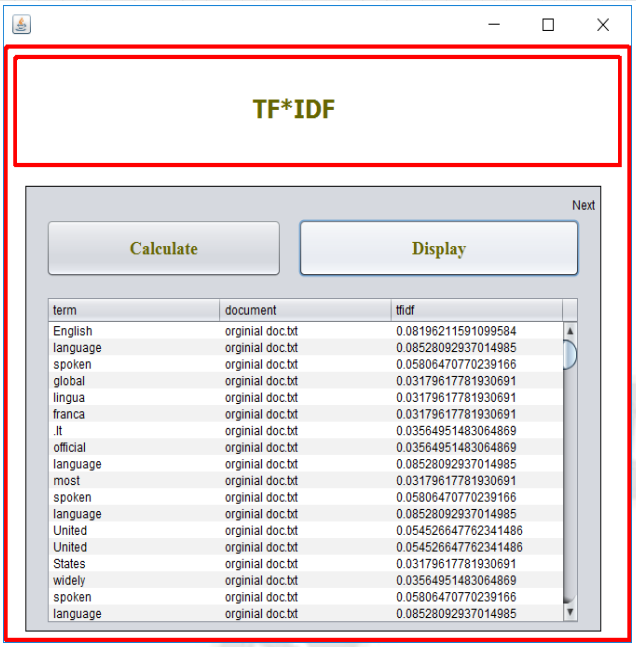

Figure 6: Word Weight Calculation

E. Evaluation Measures

There are two methods used to evaluate the overview, one for internal use and one for public consumption. The bare bones test is essentially a people-based assessment. To summarize, it improved our system [1]. DEUD (F-Recall-Oriented Understudy) is one of the automated methods used to evaluate abstracts for accuracy. The adequacy of the resultant summary is often determined by the Fit rate, recall, and F-Score of the corresponding measure. To measure a system's efficacy in summarizing material, the number of sentences that appear in both the appropriate and system-generated summaries is divided by the number of system-generated summaries and the similarity measures is denoted at figure 7. Consider the ratio between the number of sentences in the summary and the number of sentences created by the algorithm. F-Score is an efficient and effective combination of precision and memory. Because it is impossible to determine whether or not the amount of summaries received is sufficient using only fit and recall, it are looking for an F-Score to quantify the quality of the summaries instead.

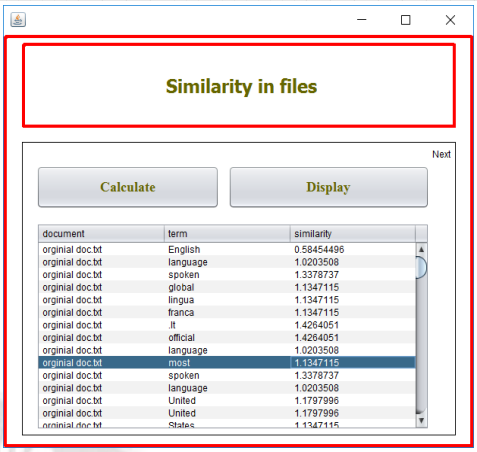

Figure 7: Similarity Finding

F. Extracting Information from Text

Natural Language Processing (NLP) [15] refers to the interpretation of human-spoken or written material. NLP is required for some complex tasks, such as machine translation, question-answering systems, information retrieval, and Information Extraction. The Information Extraction technique is crucial for data analysis, KDD, and data mining since it allows for the extraction of structured information from unstructured data. "Extracting instances of particular categories from unstructured data to give a well-structured and well-defined representation of entities and interrelationships" is a common claim made about Information Extraction." One of Information Extraction's goals is to populate the knowledge base so that relevant information can be organized and accessed. It collects documents as input and provides representations of relevant information that meet specific requirements. The IE method assesses an unstructured text rapidly and systematically by gleaning the most important relevant data from it. Therefore, the purpose of the Information Extraction method is to glean useful data from the text to enlarge the existing database or body of knowledge.

G. Hadoop Map- Reduce

MapReduce [16] is a framework that allows you to securely write programs that process large amounts of data into a large cluster of standard hardware parallelly. It consists of two important tasks: 1) Map and 2) Reduce. The Map takes one record, converts it to another, and splits the individual parts into key/value pairs or tuples. The reducer task takes the output of the card as input and merges the data tuples into a collection of smaller tuples. Reduction jobs always follow map-reduce.

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The map-reduce algorithm

Initialize:

//Sorted the atoms into their respective groups using a key =Natom% R and assign each atom a key

//Created a hash function by dividing the energy functions into 5 subfunctions. (k2) to map each function

AllocateT=INITIAL TEMPERATURE, S=S0e=E(S0),e-best=eandsbest=S

for k for M times do

Map(k1,v1)=(k1,ev1)

Reduce1(k1,ev1)=(k2,sum(k1,ev1))

Set enew = Reduce2(k2,ev)

if P(e, enew, T) > random() then //update energy

Set S= Snew;

Set e = enew

if e < e-best then

Set s-best =snew;

Set e-best =enewt

End for

This map-reduced approach enables us to scale across a huge number of atoms that have been partitioned into mappers and reducers.

H. Algorithm (FVI)

The FVI algorithm is as follows:

Step 1: Document Similarity Scores are computed between each document's Document Query and its source.

Step 2: The outcomes will be given to each source document's tags. If multiple ratings are given in a day, the ratings will be merged. For example, seagull and bird tags get multiple points (0.7 + 0.5) and (0.5 + 0.3), respectively.

Step 3: Tags gets ranking according to the score. Based on the score, top K tags are returned as recommended Tags. In this case, Subject Similarity is fixing the document Similarity. The Stanford Topic Modeling Toolbox 17 is used in combination with a foldable one. The Variation Bayesian is used to identify the topics from the source document. This will create unigrams, bigrams, and trigrams for each document. Take these and merge them with the document's contents to create one. The FVI method requires both the total number of topics and the maximum number of training repetitions as inputs.

Algorithm 3: An FVI algorithm converts the document collection with additional text Meta Data (MD`) into document collections with Tag.

Input: MD′= {md′$_1$, md′$_2$, ..., md′$_N$} where md′=<c, x>

Output: MD = {md$_1$, md$_2$,..., md$_N$} where md=<c, y>, TL = Tag Library

1 initialization;

2 TL = Ø;

3MD = Ø;

4 foreach m*d*′€M*D*′**do**

5 <c, x>= md′;

6x′← Normalize (x);

7index← indices (x′);

8 y← eliminate duplicates(index);

9 Add y to TL;

10 Add<c, y>toMD;

11 end

12 return***MD, TL*;**

The FVI algorithm is mainly used for recommending Tags. You can first convert the text component to a tag so that the algorithm can annotate the text metadata. Tags given a collection of documents by auxiliary metadata for text, MD'= {md'1, md'2...md'N} where md'€ MD'=<c,x> (c is the main document the text part, where x is the associated auxiliary text component), converts MD'toMD = {md1, md2...mdN}. Where md € MD =<c, y>(c remains the body of the document, and y is the relevant tag).

As input, the FVI method employs a collection of documents with an extra text component (MD'). The output is a collection of documents with tag-like MetaData (MD) and the Tag Library (TL). In the event of insecure communication, this method first cleans up theincorrect Text Component, characters, stopwords, and stemsthat are coming under a tag. This is a tag-based document annotation technique for documents that contain additional text components such as pseudocode and its most important textual information.

The three features generated in Section 8 are normalized, given similar weights, and combined into a single feature vector that describes the scene from several perspectives. Obtaining normalized features requires solving the following equation

$$f_I^c(t) = \frac{f_I^c(t)}{\sum_t f_I^c(t)}, \quad c \in \{hsv, dct, gist\} \quad (8)$$

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Where $f_I^c(t)$The t-th feature is a vector component of the primary feature $f_I^c(t)$ represents the feature vector after normalization. The classification result has shown in figure 8. I can represent the fused feature IF for image 6.

as :

$$F_i = \{f_I^{hsv}, f_I^{dct}, f_I^{gist}\} \quad (9)$$

Where$f_I^{hsv}$is the HSV color feature,f_I^{dct} is the DCT-based texture feature and f_I^{gist} is the GIST descriptor.

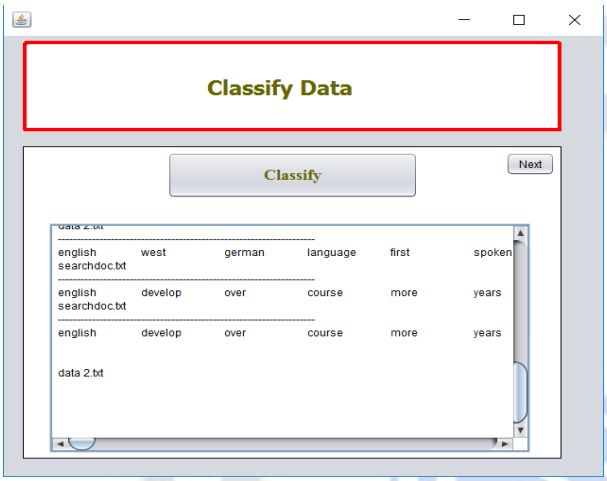

Figure 8: Classification Result

run:

Finished reading stop words.

Found 0 test instances

Started reading test files

Finished reading the text files

I finished writing test files-test.txt

Time is taken to build test file = 13 msec

Accuracy = 98.5

Time is taken to classify = 5.8msec

Finished writing output result file= result.txt

BUILD SUCCESSFUL (total time: 0 seconds)

IV. RESULTS AND DISCUSSION

The DEUD method was implemented using the JAVA (JSP) web Programming language with the client-server model and intranet infrastructure with IOT. The goal is to discover and create new methods for effectively handling, managing, and storing unstructured data with multiple client systems. Unstructured data problems make it harder to retrieve valuable information.

A. Experimental Result

To evaluate the number of parameters, methods are used to calculate the representation of true-positive and case-positive. The accuracy metric can rely on four characteristics that are used to reach the number of positive results and the exact value of the positive answer. These features are:

- True Positive: TP is the right document to be identified as the right class.
- True Negative: TN is an improper document and is identified as an improper class.
- False positives: FP is an illegal document and has not been properly identified as a proper class. Therefore, this is a single type of error.
- False Negative: FN is a good document that has been improperly identified as a bad class. Therefore, this is another type of error

The accuracy parameter is a parameter that indicates the number of documents that have been determined correctly.

$$Precision \frac{TP}{TP+FP} \quad (10)$$

The recall parameters are parameters that specify how many suitable documents are found. The recall parameter calculates the true positive values and that value is divided by the sum of the true positive values with the false negative values:

$$Recall \frac{TP}{TP+FN} \quad (11)$$

The F-Measure method act as a harmonious combination of accuracy and recognition. These are the best ways to produce the result. Even though this approach has the complexity to use to take the right decisions. And the F – Measure returns values to evaluate the result.

$$f - Measure \frac{TP+TP}{TP+TN+FN+FP} \rightarrow (12)$$

It compared the execution time with algorithms like SVM, FVI, Random Forest, and Naïve Bayes. The FVI has performed with 108 MSC, as shown in figure 10. The memory utilization has differentiated with various file size and various algorithms is denoted in table 1. In table 1 discussed with execution time, memory and accuracy values are displayed.

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Table 1: Memory Utilization

Testing +A1:F41	Size of Data	Algorithm	Execution Time in Ms	Memory Utilization (%)	Accuracy
File1	319.12KB	FVI	5.8	8	98.5
		SVM	7	12	94
		SV^2M	6	11	94.8
		Random Forest	9	15	95
		Naive Bayes	7.9	13	96
File 2	814.21KB	FVI	6.2	8.5	98.7
		SVM	7.6	13	94.3
		SV^2M	8.2	12	94.5
		Random Forest	10.2	18	95.3
		Naive Bayes	8.9	12	96.3
File 3	1125KB	FVI	6.5	9.1	98.4
		SVM	7.7	14	94.5
		SV^2M	8.7	13	94.8
		Random Forest	10.6	19	95.7
		Naive Bayes	9.1	13.2	96.6
File 4	3067KB	FVI	6.5	9.1	98.4
		SVM	7.7	14	94.5
		SV^2M	8.7	13	94.8
		Random Forest	10.6	19	95.7
		Naive Bayes	9.1	13.2	96.6
File 5	367.56MB	FVI	5 .5	9.1	98.4
		SVM	7.7	14	94.5
		SV^2M	8.7	13	94.8
		Random Forest	10.6	19	95.7
		Naive Bayes	9.1	13.2	96.6
File 6	1234MB	FVI	6.5	9.1	98.4
		SVM	7.7	14	94.5
		SV2M	8.7	13	94.8
		Random Forest	10.6	19	95.7
		Naive Bayes	9.1	13.2	96.6
File7	5186MB	FVI	6.5	9.1	98.4
		SVM	7.7	14	94.5
		SV2M	8.7	13	94.8
		Random Forest	10.6	19	95.7
		Naive Bayes	11.1	13.2	96.6
File8	365.23GB	FVI	6.5	9.1	98.4
		SVM	7.7	14	94.5
		SV2M	8.7	13	94.8
		Random Forest	10.6	1 9	95.7
		Naive Bayes	11.12	13.2	96.6
File9	576GB	FVI	3.5	9.1	98.4
		SVM	6.8	14.4	94.5
		SV2M	8.7	15.2	94.8
		Random Forest	11.26	20.1	95.7
		Naive Bayes	12.1	15.2	96.6
File10	750GB	FVI	3.2	8.3	98.3
		SVM	6.7	14.6	93.5
		SV2M	7.7	15.7	92.8
		Random Forest	12.36	21.4	91.7
		Naive Bayes	13.4	17.45	94.6

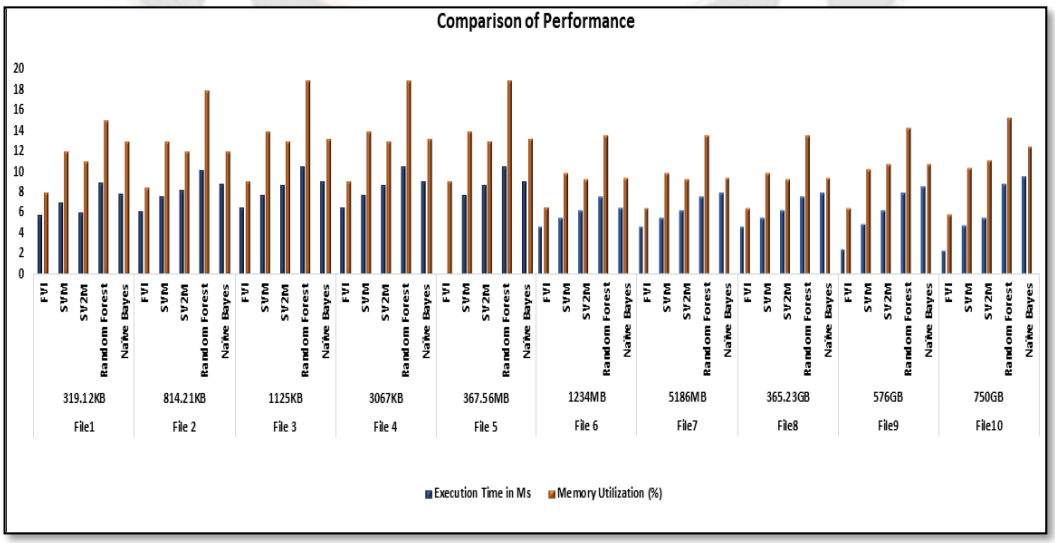

Figure 9: Memory utilization graph

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The comparison graph for memory utilization is represented in figure 9. Figure 9 shows the comparison of the proposed method with existing methods with multiple files and various file sizes such as 319.12KB, 814.21KB, 1125KB, 3067KB, 367.56MB, 5186MB, 365.23GB, 576GB and 750GB. In comparison file 1 has 319.12KB execution time of the proposed FVI is 5.8 and memory utilization time is 8. File10 has maximum size but its memory utilization is 8.3 and execution time is 3.2. When compare with all other methods FVI gave minimum execution time and minimum memory utilization time for maximum file size than other existing methods. Figure 10 shows the comparison of accuracy with existing methods.

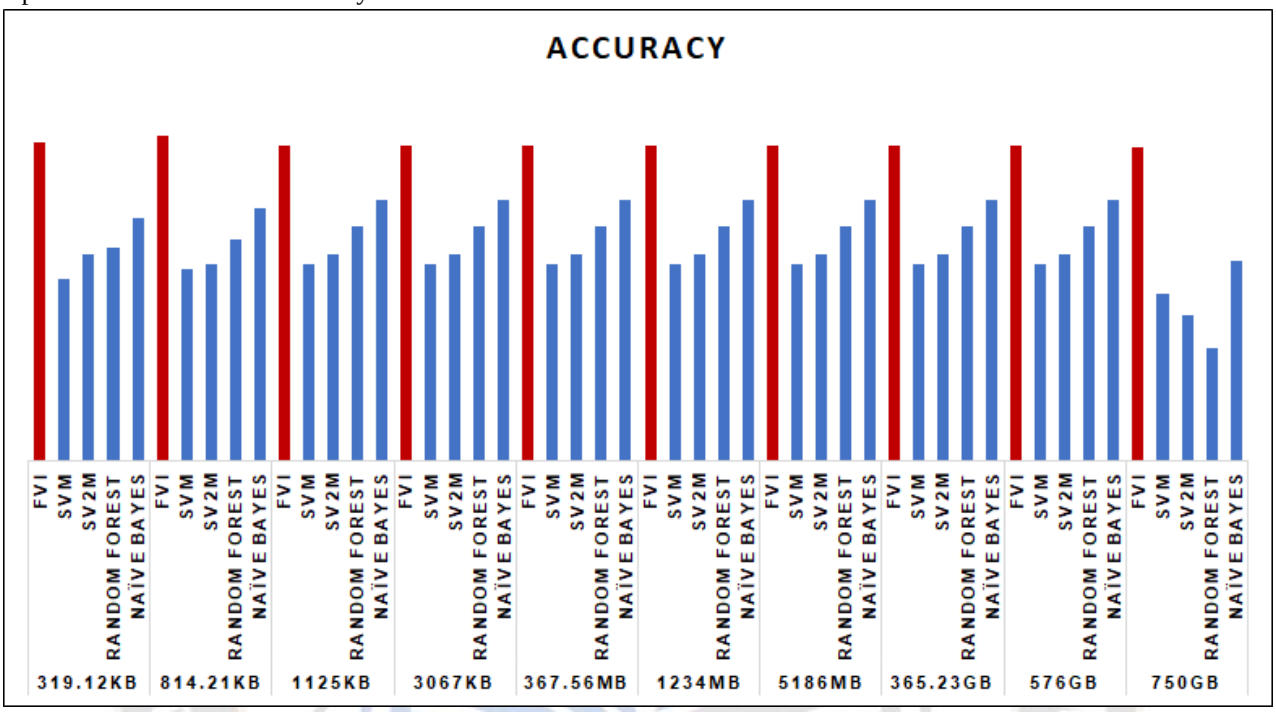

Figure 10: Comparison of Accuracy

Figure 10 shows the comparison of FVI with other proposed methods. FVI gave higher accuracy 98.7% than other methods such as SVM,SV2M,Random Forest, and Naïve Bayes. While extraction of multiple files the execution time, and memory utilization of the proposed method FVI is minimum and higher accuracy than other existing methods. The proposed method gave better accuracy even though its file size is high.

V. CONCLUSION

The proposed FVI-BD architecture for IOT device Information Extraction in Big Data server. The methodology is presented here as a means of reviewing unstructured data collected from massive data servers. The method was developed with the developing cosine similarity protocols that are both effective and preserve data protection in response to the needs for effectiveness in handling huge data and data protection. In this research paper, the unstructured data has normalized with POS tagging and features are extracted with weight vector and the information extracted using NLP with wordnet. Finally the classification has done with FVI algorithm. The FVI has achieved with 98.6%. In order to arrive at the conclusion, different data sets are investigated. This result provides a representation of data that is not restricted in any way. The pace of expansion of unstructured data is really rapid. The analysis of Big Data is extremely accommodating, allowing useful structured information to be derived from vast amounts of IOT device unstructured data. In order to improve Big Data analytics in the future, IE's multi-step pipeline of diverse unstructured Big Data will be expanded in all conditions.

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