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Machine Learning for Industrial Accident Prediction and Analysis

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ABSTRACT_ With the different businesses in today's environment, there is a huge development in the measure of information being created from various sources. With this tremendous measure of information being generated day by day, there is a requirement for the information to be investigated and be managed methodically. There has been an increase in the number of accidents ever since the evolution of such industries. Even with the diverse industrial safety and accident prevention systems available, they haven't been efficient in managing a wide range of parameters and be able to effectively predict them by handling a large amount of data. Moreover, with the existing systems, the cost of planning and storing the data is soaring. In this research, a conceptual system is made that utilizes low cost storage and process data in less time. It additionally utilizes Machine Learning, NLP and Random Forest calculation so as to comprehend and foresee mishaps in Industrial condition. The industrial data is procured from one of the largest industries in Brazil and the world which records the industrial accidents that took place in every nation. The information is investigated and prepared with Machine Learning algorithm so as to comprehend the reasons for such incidents and how the expectation of future accidents can be done. Subsequently, the framework can think about an assortment of parameters and decide future happenings with exactness.

1.INTRODUCTION

Industries have become quite a vital part of today's world that without it, it would be difficult to sustain in the world. Industrial growth and development are significant as it plays a big role in our economy, development of the country as a whole and earns revenue. The requests and needs of the individuals have been rising due to the populace upheaval too. To cope up and keep up to this, industries are required in the world. Not only that, but industries also provide various employment opportunities for people to work in them. Clearly, the more the businesses, the more the working individuals. It means that a solitary industry is answerable for an enormous number of working individuals

just as its environment. The wellbeing of these laborer's is a need of great importance. In our endeavors to make out a living through various callings, we have disregarded numerous significant parts of life and committed a few errors. These are making undesirable states of work, expanding the danger of ailments, the danger of mishaps in the processing plants another mechanical establish-ments and ruining the earth, by making contamination and even by disregarding the wellbeing standards, which takes steps to make difficult issues of wellbeing, both physical and mental. Industrial accidents are quite fatal and can cause quite a loss. Those that occur in the workplace can cause harm to employees, environment and damage to the equipment. Industrial related accidents, injuries and fatality data demonstrate that continued efforts and effective measures are necessary to reduce the number of industrial accidents, illnesses and fatalities. A worker dies of occupational injury every three minutes and about every second at least four workers get injured according to the International Labor Organization (ILO). India happens to be one of the nations with the most elevated record of such Industrial accidents. When looking into Indian industrial accident data, it's found that about 47 factory workers are injured and a handful of them die every day. Data from the Labor and Employment Ministry reveal that in three years (2014-2016), 3,562 workers lost their lives while 51,124 were injured in accidents that occurred in factories across the country. Gujarat, Maharashtra and Tamil Nadu are the top three states when it comes to fatalities. All though neither the government nor the public has held Indian industry adequately account for the thousands of deaths each year. Also, according to International Labor Organization, every year, 250 million accidents occur causing absence from work, the equivalent of 685,000 accidents every day, 475 every minute, 8 every second and 12 million children working undergo occupational accidents around with 12,000 are fatal. The few reasons for fatal accidents in factories are mainly due to lack of management commitment, failure to develop safety culture and noncompliance of safety systems. Even with various existing safety measures and systems that have been proposed or being followed, there isn't an exact accurate one present that can help in eliminating such fatalities to increase. Every organization present in the world follow a certain set of rules and regulations that ensure workers safety and their security in the work they have been assigned. The mishaps that occur fall into the responsibility of organizations for which compensation would be required for the causes. Around

600,000 lives would be saved every year if available safety practices and appropriate information were used. In order to analyze and predict such fatalities, this paper aims to propose a system which can collect large datasets from various industries, analyze them and the ability to predict and reduce future accidents. Along with that, the proposed system focuses on building a real-time analysis of industrial data which can help in the retrieving of any sort of accidents in a faster manner. A large data set is handled effectively and looked onto by utilizing the aspects of Machine Learning

2.LITERATURE SURVEY

[1] Long Wang, Xiaoqing Wang, Aixia Dou, Dongliang Wang "Study on construction seismic damage loss assessment using RS and GIS" International Symposium on Electromagnetic compatibility, 2014.

In this paper, a quick assessment method for earthquake emergency is introduced. The method contains two different modes to obtain damage information from remote sensing images, one of which is based on damage index and the other adopts image classification. The damage index mode relies on traditional visual interpretation. After the damage index is given by experts, the ground intensity data can be gained, and then loss estimate parameters will be acquired from the experiential vulnerability matrix. The image classification mode is an application of digital image processing technique. Those loss estimate parameters can be calculated from the classification result which is sorted by the type of buildings and ranged by the damage degree. While the assessment models are introduced, the action of multi-resourced estimate data is explained to show how to find parameters in various data.

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[2] Ramli Adnan. Abd Manan Samad, Zainazlan Md Zain, Fazlina Ahmat Ruslan "5 hours flood prediction modeling using improved NNARX structure: case study Kuala Lumpur", IEEE 4th International Conference on System Engineering and Technology, 2014.

Flood is one of natural disaster that has becomes major threat around the world. Flood disaster may damages people's life and property. Therefore, an accurate flood water level prediction is very important in flood modelling because it can give ample time to residents nearby flood location for evacuation purposes. However, due to the dynamics of flood

water level itself is highly nonlinear, Artificial Neural Network (ANN) technique is a good modelling option because ANN was widely used to solve nonlinear problems. NNARX is one type of ANN model. Therefore, this paper proposed flood prediction modelling to overcome the nonlinearity problem and come out with advanced neural network technique for the prediction of flood water level 5 hours in advance. The input and output parameters used in this model are based on real-time data obtained from Department of Irrigation and Drainage Malaysia upon special request. Results showed that the Improved NARX model successfully predicted the flood water level 5 hours ahead of time and significant improvement can be observed from the original NNARX model.

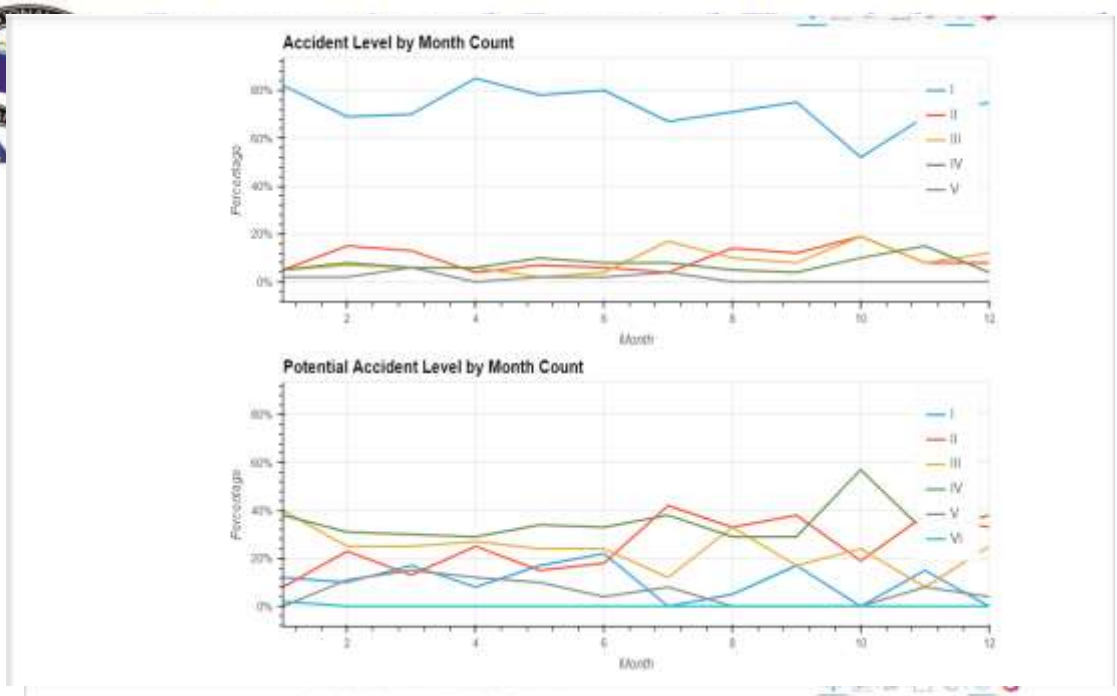
[3] H Takata, H. Nakamura, T Hachino "On prediction of electric power damage by typhoons in each district in Kagoshima Prefecture via LRM and NN", SICE Annual Conference, 2004.

4.RESULTS AND DISCUSSION

Kagoshima Prefecture has suffered from natural disasters by typhoons repeatedly. They hit power systems very badly and sometimes cut off electricity. To ensure the rapid restoration of electricity supply, one needs to predict the accurate amount of damage by typhoon in every region. This paper considers the damage prediction in each district in Kagoshima Prefecture by using a two-stages predictor. It consists of LRM (linear regression model) at the first stage and NN (neural networks) at the second stage. This predictor enables us to predict the number of damaged distribution poles and lines from weather forecasts of typhoon. Effectiveness of the approach is assured by applying it to the actual data.

3.PROPOSED SYSTEM

The aim of the proposed system was to design a way to analyze multiple accident data, parameters involved and determine a way to ensure such fatalities don't occur in the future


Accident Level by Month Count
Percentage
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Potential Accident Level by Month Count
Percentage
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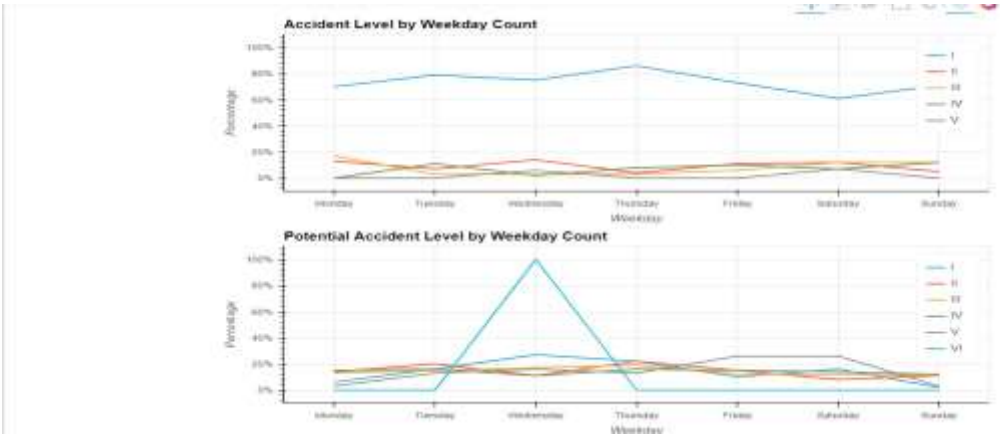
VI


Accident Level by Weekday Count
Percentage
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Potential Accident Level by Weekday Count
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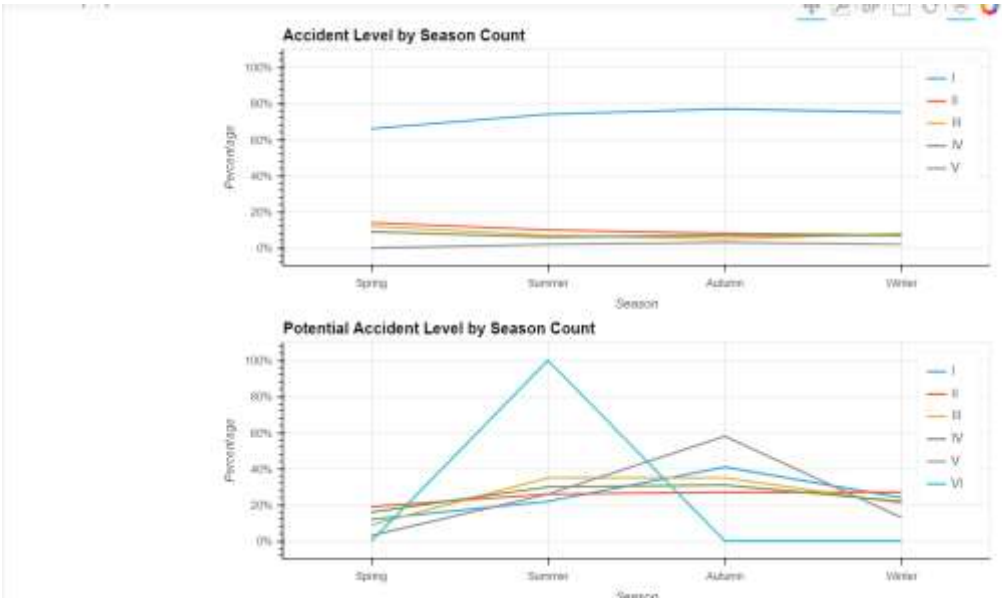
Accident Level by Season Count
Percentage
Spring
Summer
Autumn
Winter
Season
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II
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Potential Accident Level by Season Count
Percentage
Spring
Summer
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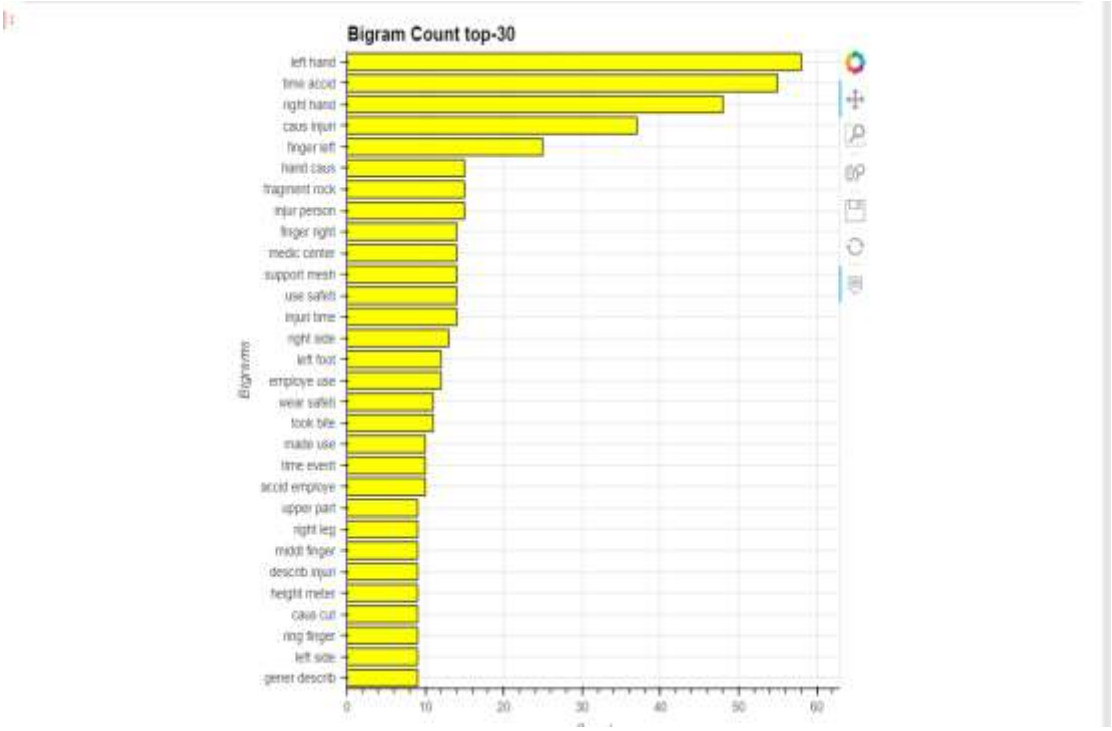

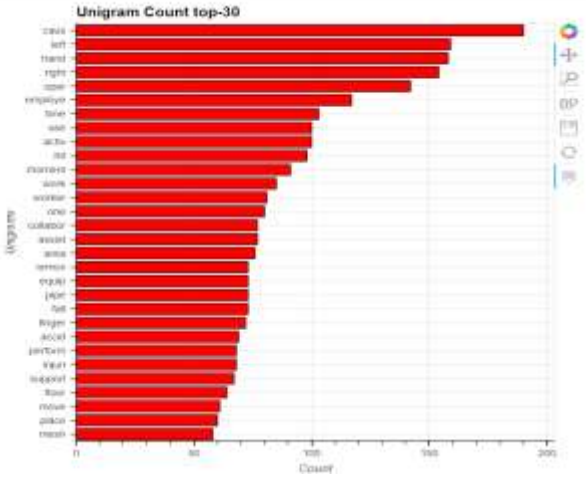

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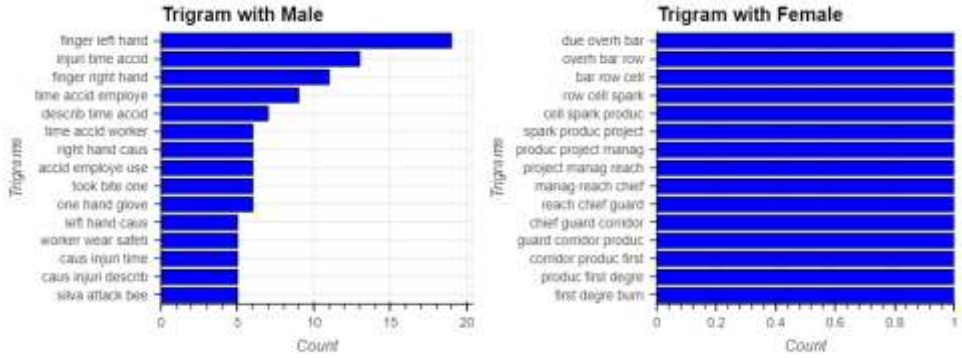

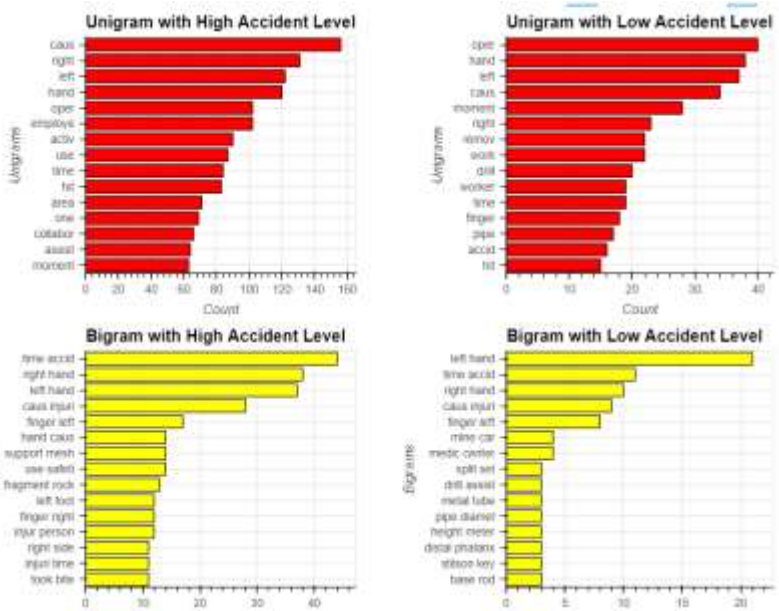

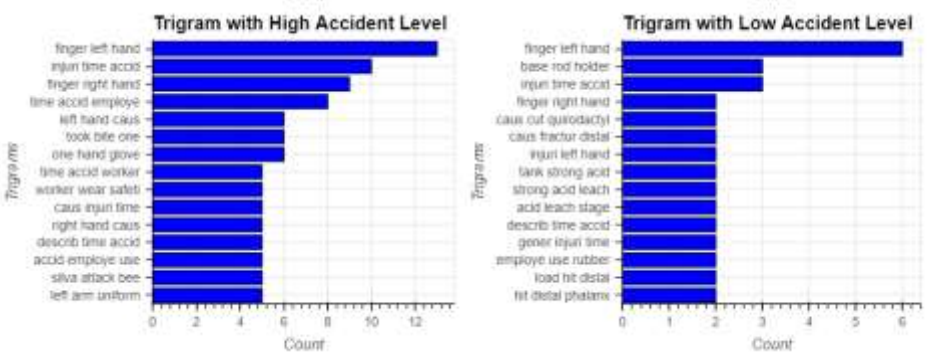

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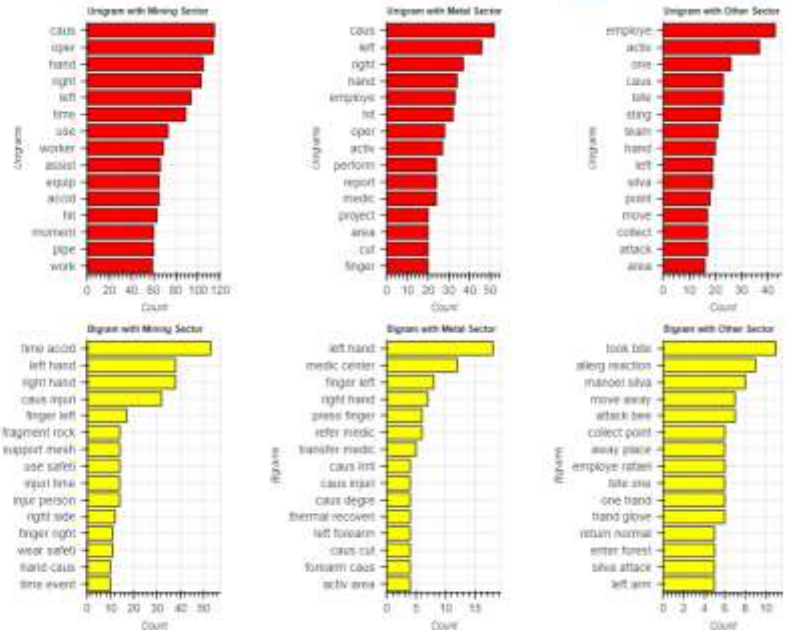

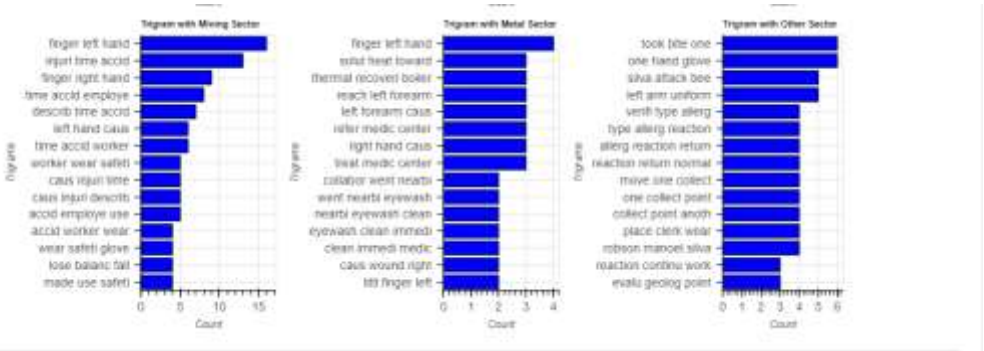

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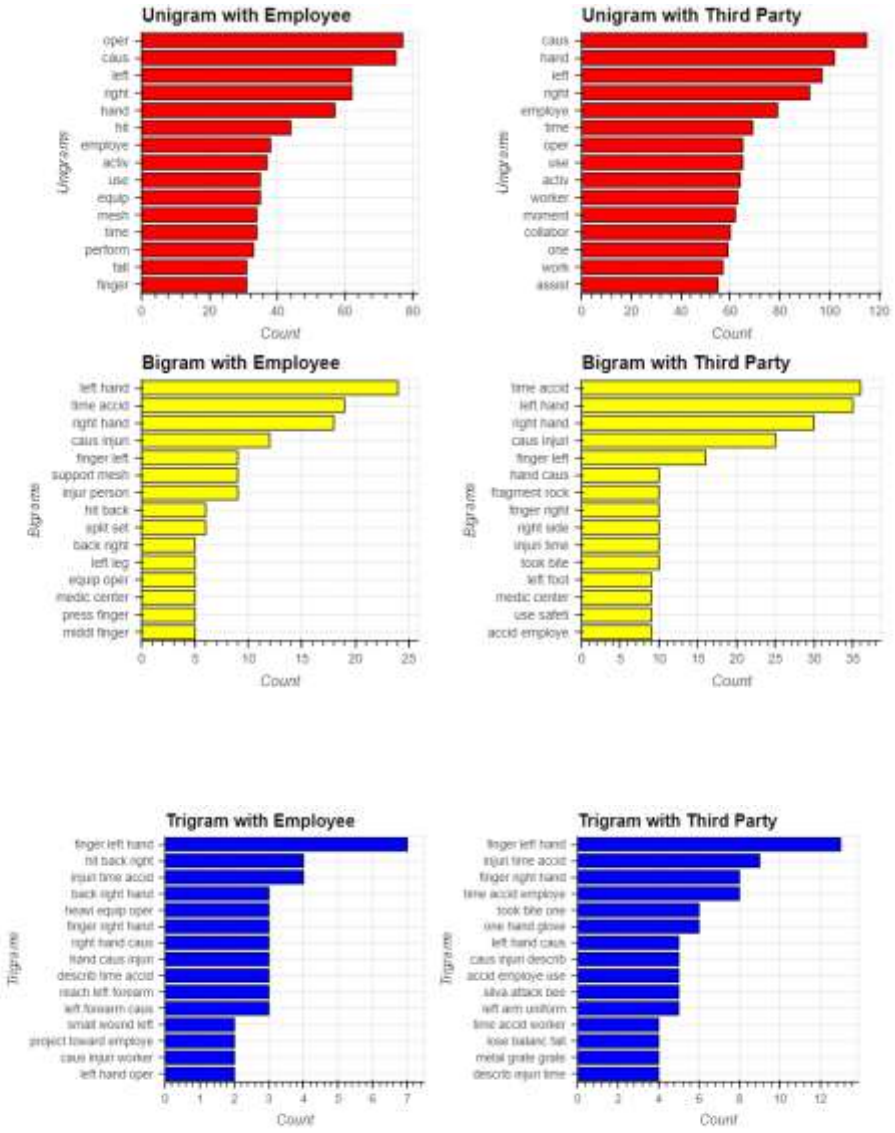

5.CONCLUSION

The system that was proposed was in an aim to analyze and create predictions of Industrial accidents from a publicly provided dataset. Using the dataset, the system was able to read the data, clean the data, produce various analyses and statistics along with making predictions based on the model it was trained with. With the use of Random Forest Classifier, it can be depicted that it is comparatively a better algorithm than by using single trees. The system can be used for any industry and this can also be mean to help industries in getting to know better about the fatalities that occur. Also, the system aids in understanding the data and result out a prediction so as to ensure in keeping the employees safer from any further happenings. 1. Lack of valuable data: A machine learning algorithm often requires tens of thousands of data [35] to be trained in order to get an effective model. The acquisition of these basic data often

requires manual operations and the speed cannot be guaranteed..

FUTURE SCOPE

In future enhancement we will add some more algorithms to predict efficiently.

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Ms.M.Anitha Working as Assistant Professor & Head of Department of MCA ,in SRK Institute of technology in Vijayawada. She done with B .tech, MCA ,M. Tech in Computer Science .She has 14 years of Teaching experience in SRK Institute of technology, Enikepadu, Vijayawada, NTR District. Her area of interest includes Machine Learning with Python and DBMS.

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