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Implementing Artificial Intelligence in CDR & Links Failure in Telecom Technology

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Abstract: ***This Paper is about implementing Machine Language Technology in Important day to day operations of Telecom Industry. CDR (Call Details Record) is one of the Primary Operations of Telecom service Provider for Charging Monthly Expenses to the Subscribers.Implementing AI in Telecom Links Failure is another Agenda of this Paper.***
Keywords: Artificial Intelligence, Classification, Regression, Entity Recognition,PBX,Natural Language Processing

I. ARTIFICIAL INTELLIGENCE

Artificial Intelligence has 6 main Principles, which has to be adopted for Automating Day to Day Operations in Telecom.

The Six principles of AI which has to be implemented for Automation in Telecom are as Follows:

A. Fairness
B. Reliabillity & safety
C. Privacy & Security
D. Inclusivemess
E. Transparency
F. Accountability

Apart from these AI Principles Certain Techniques in AI has to be adopted for automating Telecom Operations.
Those Techniques are Classification,Regression,Entity Recognition & Natural language Processing.

II. CDR GENARATION & LINKS FAILURE IN TELECOM

CDR is generated every Month for all customer & clients for Billing Purposes.CDR Contains Information such as Called Number, Destination,Pricing Charges, Price of Particular call, Duration of a call.AI Principle Implemented in CDR Report generation is the Primary agenda of this paper.
Links Failure in Telecom is the failure of Primary/Secondary Links to Which PBX is connected for Operations to the Customer.Due to the failure of Links both the Inbound and Outbound calls are not Possible.Using AI Principles Alerts are generated Which is the Secondary agenda of this Paper.

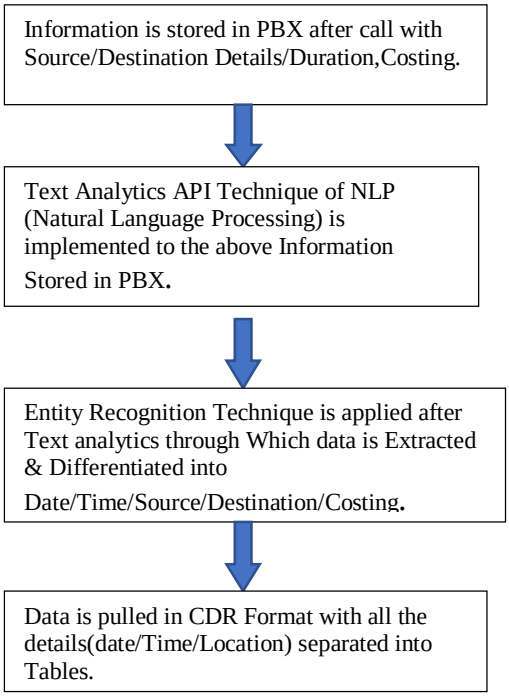
A. Artificial Intelligence In CDR

Natural language Processing is used for Automating CDR Reports in Pbx.In Natural language Processing we are adopting Entity Recognition & Regression Techniques to Automate CDR Reports.

1) *Entity Recognition in CDR Reports:* Entity Recognition use Key phrase Extraction to recognise the data in Time, Location, source, Destination, Duration. The Text Analytics API is a cloud-based service that provides Natural Language Processing (NLP) features for CDR analysis, including Regression and sentiment Analysis. Entity extraction in CDR is an information extraction technique that identifies key elements (Date,Time,Duration,Location) from text, then classifies them into predefined categories with the help of Text Analytics.

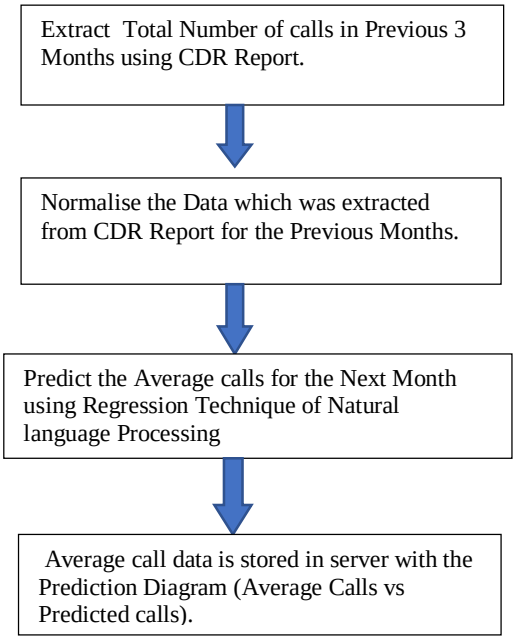
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Flow Diagram Of Entity Recognition In PBX



2) *Regression Technique in CDR:* Number of calls in a Month has to be calculated every Month to find mean average calls of a call center in a Month.This process can be Automated with the help of Regression Technique of Natural language Processing. Regression is a form of machine learning that is used to predict a numeric label based on an item's features. Regression is an example of a supervised machine learning technique in which you train a model using data that includes both the features and known values for the label, so that the model learns to fit the feature combinations to the label.

Flow Diagram of Regression in PBX



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B. Artificial Intelligence In Link Failure

Natural language Processing is used to detect Link Failures in Pbx.In Natural language Processing we are adopting Classification Technique to Predict Link Failure.

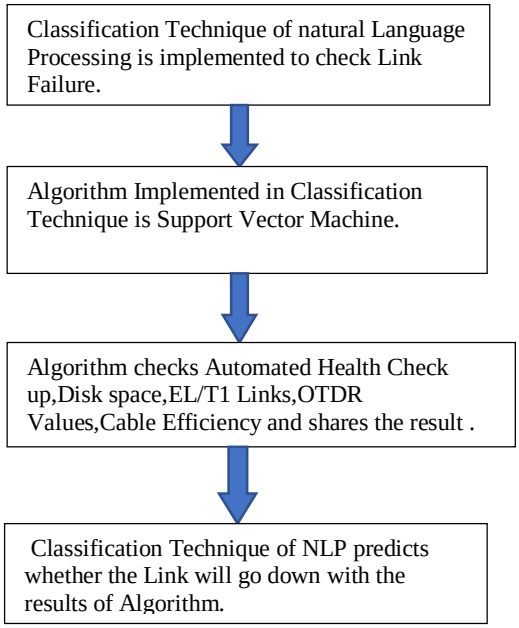
Support Vector Machine is an algorithm for supervised learning which are extensively used for regression, and classification.

Classification in Artificial intelligence is to predict Whether the Event will happen or Not.In simple Words we can say it is an If /Else Condition.

When Primary Link in PBX Goes Down automatically Fail over will happen to confirm there is no Down time to users.But this Classification technique is used to predict Whether Link will go down using parameters of PBX Devices.Parameters include Automated health check up,Disk Space Allocation in Pbx,E1/T1 Port status,OTDR Values.

Classification Technique of NLP Predicts Whether the Link will go down with the help of Algorithm.

Flow diagram of link failure prediction in PBX



C. Applications Of Artificial Intelligence In CDR & Link Failure

1) CDR

a) CDR can be retrieved from PBX within the shorter frame of time without the intervention of Human beings.

b) Accuracy will be 99% Since Machine Language concepts are implemented in CDR Capturing.

c) There will be no discrepancy in billing to customers since errors by Machine Learning Principle is Negligible.

2) Link Failure

a) Machine Learning Principles in Link failure help us to understand the Possibilities of Link Failure well in Advance.

b) As A result of this Application, the Efficiency in Providing services to the Customer is Increased since 99% Accuracy is achieved by Machine Learning Techniques.

c) Downtime of the service is decreased since AI Predicts the Possibility of Link Failure well in Advance.

D. Links and Bookmarks

Industry related Microsoft Topics has been taken into Account for this Paper. The Following is the URL

1) .https://docs.microsoft.com/en-us/learn/modules/create-regression-model-azure-machine-learning-designer/explore-data

2) https://westus2.dev.cognitive.microsoft.com/docs/services/TextAnalytics-v3-1/operations/KeyPhrases

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III.CONCLUSIONS

Automation in Telecom sector is the challenging task since lot of Numeric conversion are there which are Directly associated with costing. These challenges are overridden with the help of Artificial Intelligence(Machine Learning) Which provides 99% Efficiency in all the Automation Works & helps in Achieving the proposed Target.
AI in Telecom (CDR Report Generation & Link Failure) will improve the Quality Assurance & Continued Service to the Customers.

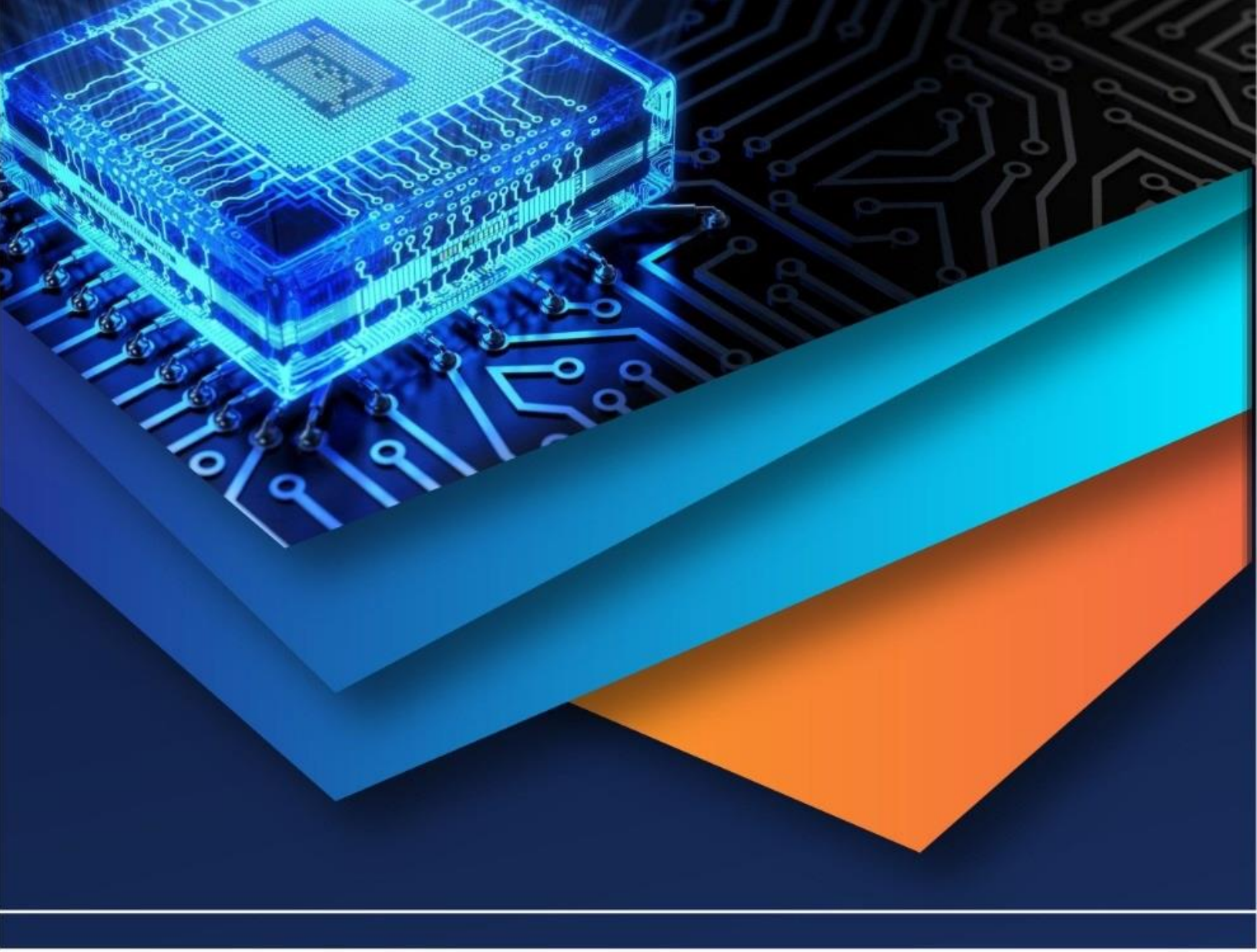
IV. ACKNOWLEDGMENT

Microsoft Azure technology has been Widely used in this Paper to achieve the NLP Results in Telecom Sector.

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