Implementation of Live Data Analytics using Machine Learning Techniques and FPGA

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Abstract : Data Analytics is a buzz word for last 3 years in IT world. Data Analytics changed the shape of IT applications. Data Analysts positions are increasing day by day in all IT companies. The analytics era also open doors to young entrepreneurs to start startups purely based on Data Analytics. The Applications of data analytics is not limited to IT , people from other industries started thinking how they can make use this data analytics to give best throughput. Market is also dependent on cloud as well to store their data instead of buying and storing data in physical servers. It opened Doors to all Industries not only IT to work on Data Analytics. TO give an example in Aerospace Industry in order to maintain data of Non Destructive Testing and use it for periodic tests before they used to go with traditional methods to store data in Books and do the calculation when they want. Now the Applications are developed such a way that the Data Will be stored in Cloud, when one aircraft come for NDT(Non Destructive Testing) instead of wasting time to know about previous test details parallel while doing test the people can compare with previous results using any of the analytical methods . They could save time as well as money. In this Research Paper it is one more step ahead on How to Process Live Data Before storing into Cloud? It will redundant data in cloud and also avoid unnecessary memory wastage. Accessing live Data is not that much easy but still in detailed methods has to be incorporated in order to access live data. The major focus in this research has been taken on the Social Networking Sites where now a day's most of the illegal issues are taking place. So in order to identify this problems in this paper few techniques has been identified based on severity of the issues.

Index Terms: Aircraft, Cloud Computing, Data Analytics, Memory, Non Destructive Testing

I. INTRODUCTION

As discussed above the Invention of Cloud and Data analytics has changed the life of a human being who is using different technologies. To give an example considers applications like Drop Box, Gsuite, and Face book. In this paper main concentration will be on social networking sites how the live data analytics can be applied in order to improve the security of the applications and also Block unwanted messages and users in social networking sites. The Biggest Challenge here is Data Preprocessing and Comparative Study on Existing and New Data [2]. Along with this the other challenge is networking or Wireless sensor networks to access data from cloud. To implement and address the above problems the concept of Data Science and Machine Learning algorithms will be incorporated. Along with Data Analytics and Cloud Computing.

II DEFINITIONS

A.Cloud Computing: This is used to store and manipulate data produced by applications. There are so many cloud storage providers likely AMAZON AWS, Azure, Rackspace etc..,Data Analytics: In order to process this data and to get results in a way how the client required. To give an example in a given data those who are using face book ...the data can be easily analyzed using mining of data or extraction of data. Consider scenario out of given data of face book users from Bangalore ,need to identify the people who studies in Delhi Public School, Bangalore then the analytics play key role[2]. Means when data need to be extracted by applying deeper and deeper analysis then the data analytics are useful. Now a day's most of the applications are working with the help of data analytics and cloud computing. Cloud computing is used to store the data and to process the data the concept of data Analytics is used.[5] The technology is growing day by day and along with the cloud computing and data analytics the concept of Data Science is introduced in order to improve the process of cloud and data analytics. Data Science made life of cloud based applications much easier after introducing the Data Science. Data Science will take care of major four activities like Data Collection, Data Preprocess, Data Cleaning and Data processing activities.[2] After performing all the above steps now the data is ready for final usage. Means the day can be easily store in the cloud and can be applied analytics to get required output

III. LITERATURE SURVEY

Let us consider an application like Drop Box where the data will be stored in the cloud. In order to store the data in cloud using application like Drop Box[5] first user has to collect the data from the user and once the data collected it will be preprocessed by using different techniques in order to find out is there any virus or some unnecessary data is getting uploaded. One the Process is done the data will be ready for upload but the application here though it work online but the data is not live data and if data is live also it should undergo some process then only it will be uploaded. This is the way in which the current applications are working. The problem is that live data analytics.

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Let us consider an example, person A sending an abusing message to B, according to the existing method the message would go through entire Process and stores in the Data in cloud [3] and same will be displayed in Destination account. Consider if the message is having some illegal information or unnecessary data which needs to be avoided before it reaches the destination it is not possible in current scenario. A Wireless Sensor Networks typically consists of numerous extremely cohesive sensor nodes, called smart sensor nodes that have communication competencies, a processing module that can store data, the sensing unit and a power module that permits autonomous procedures [6]. Exactly this is the place where exactly the need of Live Data Analytics [2] raised before sending data it needs to be preprocessed and comparative study should be doe then only it will be sent to destination.

IV. PROPOSED SYSTEM

In proposed research Machine learning algorithm is designed in a way that it will handle multiple tasks before storing data into cloud. The Algorithm or the Machine Learning System[1] will be doing Comparative Study based on Key Words which are not supposed to be used and also which are having similar synonyms. In order to perform this the concept of machine learning algorithm will be implemented such a way that once the user sends or post some message it will be preprocessed by the machine learning algorithm[1] and doing the first level comparative study where it is going to search is there any illegal words used .[2] In the Next step same will be verified for the synonyms of the words. If nothing is found illegal or abnormal the next level data will be processed towards the destination. Once the Data Reach Destination it will be preprocessed data and there won't be any kind of issues with respect to quality. So the Machine Learning algorithm should be represented such a way that it should be clear enough to do multiple tasks.[4]

Algorithm:

1. Start.
2. Collect the data.
3. Apply data science techniques to clean and preprocess the data.
4. Take the above data of step 3 as input for Machine Learning algorithm
5. Choose the appropriate Machine Learning Algorithm.
6. Process the data
7. Verify the Output.
8. Stop

The above are the basic steps need to be performed in order to avoid unnecessary data to be delivered or posted.

I the above proposed method the problem is with the processor speed how effectively the system will handle the instructions. Because the real Data or Live Data which is going to be processed is not from single person it will be from millions of users on. Take an example of Facebook there will be trillions of users who are processing data each and every data. Just imagine scenario to process this many instructions how many systems required.

TO avoid this scenario the concept of FPGA's[7] should be integrated with the cloud. Each and every FPGA will be given with few common instructions which need to processed parallel. Now what will happen the data will be process at FPGA [4] level and it will be stored in cloud?

The usage of FPGA's[4] will make less burden to processor and also improves the performance of the system as data is processed with the help of local processes.

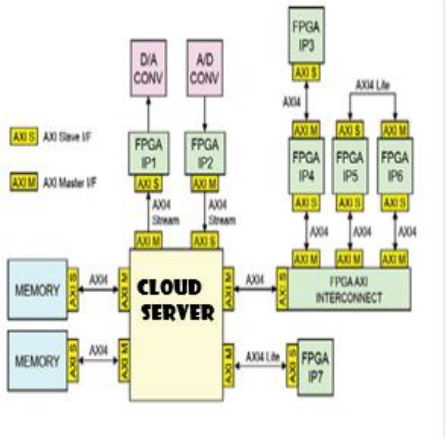

Fig 1: Cloud Server with Attached FPGA's

The FPGA's will play key role in processing the data. The cost of the solutions will be cost effective and it can be easily adoptable and transferable. In order to implement the live Data Analytics the change in application is not only sufficient there should be change in the infrastructure as well. After the Continuous research the existing infrastructure is not sufficient to implement any new technology. So whenever there is a change in the technology needs to be changed which should be adopted by the new technology. To give an example when the invention of Cloud has happened [5]every company started migrating to the new infrastructure. In the same way the Big Data changed the facilities with respect to data base. Likewise the implementation of live data analytics also need some change in the infrastructure as mentioned above.[4]

V. IMPLEMENTATION

To implement this system in real time along with algorithms and technology used concentration should be given to Framework or architecture as well.

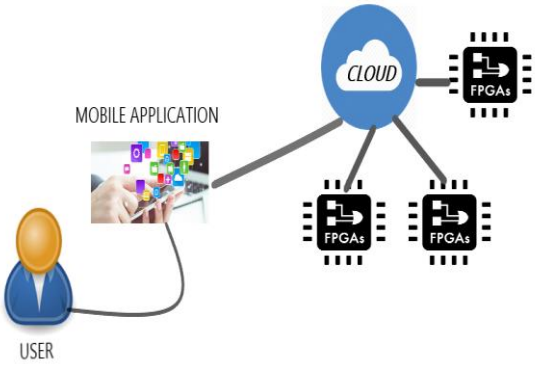

Fig (2). Framework for Live Data Analytics

As shown in Fig. (2) Is the required architecture for the implementation of Live Data Analytics. Means the Implementation of the FPGA's along with the Cloud Server will improvise the performance of the application and also data accessing will be made easy. As most of the times all FPGA's [4] are in active status. As mobile companies re keep on wasting the memory in Mobile Device for their inbuilt devices that can be controlled by making only required application to deploy on phone and remaining will be on OS. That means application deployment will take place most of the time on cloud. But the major problem here is the accessing. Though we are using 4G network still in some areas especially in developing countries like India the network issues are there. Sometimes the network will go off or the coverage will be poor where instead of 4G only 2G will be available. Another issue we may face is with respect to security though it can be solved using different techniques.
Finally in order to perform live data analytics both software and Hard ware Play Key Role.

VI. CONCLUSION

The Live Data Analytics here is only considered for the social networking websites but if they are implemented for the different application for sure the throughput and quality of the application will improve. As per statistics now a days 5-7% of the suicides are happening because of the Social Networking sites because of threatening they are getting from different people. These can be avoided very easily. And also there is a possibility that all social networking sites can be freely accessed by the people without any worry on loosing data or Data Thefts. The only area need to be concentrated after implementation of Live Data Analytics is Speed of the Network to access cloud and also on the Data Security.

VII. FUTURE ENHANCEMENT

As we connected FPGA's to cloud server and FPGA's are doing same mundane process continuously it can be easily automated using RPA (Robot Process Automation).
And also there is a possibility that the entire live data can be processed using RPA agents instead of human beings. The final results only seen by human beings in order to judge the results in the form of either pictorial representation or graphs.

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