Explorative Study of Data Science Model and Its Tools Set Comparison

**Jibran Rasheed Khan1, 2, Idrees Riaz2, Muhammad Waqar2**

1Lecturer at Department of Computer Science – UBIT, and Research Officer at HEJ, ICCBS, University of Karachi

2Department of Computer Science Information & Technology – CSIT, NED University of Engineering and Technology.

# ABSTRACT

Data Science (DS) is a scientific technique to unfold the hidden mystery of data and extract the valuable insight that can boom the business needs, beware of what probably be happened in near future and most importantly make human proactive to act than react on events. Nowadays, data is the key element that use to classify and aids in to foretell each and every aspect of human; behavior, nature, standards, lifestyle, passion, desire, business needs and lot more uncountable. But, data is not so simple nor resides in any specified form. This usually be available in any of 4Vs; Volume, Velocity, Verity and Veracity. Due to complex nature of data, many organization, scientist and practitioners suffer trouble to incorporate them in a suitable platform, desirable tools, libraries and other supportive algorithms or calculations. Also, data science itself not a separate field of study, but it’s a composition of several incorporating fields – Information Technology, Statistics and Science. The core propose of this explorative study is focused on the learning DS generic model and comparison of its tools set in the market. In this work, we will explore each aspect and compositor of data Science, drill down to identify individual field hierarchy, tools, and platform available. Furthermore, it covers the concise comparison study renewed and most preferable element in each filed. The study, will beneficial in identifying actual requirements and composite tool that will ease the practitioners to learn more, building better and flexible system and more compatible integrating features.

# INTRODUCTION

# DATA ANALYSIS TOOLS

Although, the data science is not much aged, but it captured attention of everyone across the world. This is the reason lots of companies take part in building handy tools to do the complicated tasks comfortably by offering wide range of tools. It is impossible to list every tool, we focus on some most prominent and high rated tools in the following section.

## **Microsoft HDInsight**

Azure HDInsight is a Spark and Hadoop service in the cloud. It provides big data cloud offerings in two categories, Standard and Premium. It provides an enterprise-scale cluster for the organization to run their big data workloads. Azure HDInsight is an easy, cost-effective, enterprise-grade service for open source analytics that enables customers to easily run popular Apache open source frameworks including Apache Hadoop, Spark, Kafka, and others. The service is available in 27 public regions and Azure Government Clouds in the US and Germany.

Azure HDInsight powers mission critical applications in a wide variety of sectors and enables a wide range of use cases including ETL, streaming, and interactive querying.

# Features

* Reliable analytics with an industry-leading SLA
* It offers enterprise-grade security and monitoring
* Protect data assets and extend on-premises security and governance controls to the cloud
* High-productivity platform for developers and scientists
* Integration with leading productivity applications
* Deploy Hadoop in the cloud without purchasing new hardware or paying other up-front costs

## **SkyTree**

**Skytree, Inc** is a San Jose, California-based startup company that develops machine learning software for enterprise use. Skytree came out of stealth mode in February 2012, announced SkyTree Server. It is a machine learning system to discover patterns and make predictions from complex, massive data. Skytree Server is an enterprise-grade software platform for developing, testing, and deploying advanced analytics solutions for big data. It is designed from the ground up to work on massive, fast changing, and varied datasets with high degree of efficiency and accuracy. Skytree Server’s scalable architecture performs state-of-the-art machine learning methods that were previously not possible on very large data sets. The fundamental design of Skytree Server incorporates advanced algorithms from the latest machine learning research to achieve speeds that are tens of thousands of times faster than existing approaches.

# Features

* Highly Scalable Algorithms
* Artificial Intelligence for Data Scientists
* It allows data scientists to visualize and understand the logic behind ML decisions
* SkyTree via the easy-to-adopt GUI or programmatically in Java
* Model Interpretability
* It is designed to solve robust predictive problems with data preparation capabilities
* Programmatic and GUI Access

## **Talend**

Talend is a big data tool that simplifies and automates big data integration. Its graphical wizard generates native code. It also allows big data integration, master data management and checks data quality. In today’s Big data and the cloud-centric world, it becomes very important for the organizations to harness their enterprise information. Talend is an open source software integration platform helps you in effortlessly turning this data into business insights. The ever-growing demand for [Talend Certification](https://www.edureka.co/talend-for-big-data) today is proof of its worth in the market.

# Features of Talend

* Accelerate time to value for big data projects
* Simplify ETL & ELT for big data
* Talend Big Data Platform simplifies using MapReduce and Spark by generating native code
* Smarter data quality with machine learning and natural language processing
* Agile DevOps to speed up big data projects
* Streamline all the DevOps processes

## **Splice Machine**

Splice Machine is a big data analytic tool. It is designed to scale real-time applications using commodity hardware without application rewrites. The Splice Machine database is a modern, scale-out alternative to traditional RDBMSs, such as Oracle®, MySQL™, IBM DB2® and Microsoft SQL Server®, that can deliver over a 10x improvement in price/performance. As a full-featured SQL-on-Hadoop RDBMS with ACID transactions, the Splice Machine database helps customers power real-time applications and operational analytics, especially as they approach big data scale. Their architecture is portable across public clouds such as AWS, Azure, and Google. It is designed from the ground up to be portable. Leveraging a technology stack of DC/OS, Marathon, ELK and more, applications and storage are containerized, secured and monitored with guaranteed availability. This architecture is portable across public clouds such as AWS, Azure and Google, as well as on premise infrastructure.

Splice Machine is currently available for on premise deployments and as a database service on AWS and Azure. Other cloud platforms will be added over the next few months.

# Features of Splice Machine

* It can dynamically scale from a few to thousands of nodes to enable applications at every scale
* The Splice Machine optimizer automatically evaluates every query to the distributed HBase regions
* Reduce management, deploy faster, and reduce risk
* Consume fast streaming data, develop, test and deploy machine learning models

## **Spark**

Apache Spark is a powerful open source big data analytics tool. It offers over 80 high-level operators that make it easy to build parallel apps. It is used at a wide range of organizations to process large datasets. Apache Spark has become one of the key big data distributed processing frameworks in the world. Spark can be deployed in a variety of ways, provides native bindings for the Java, Scala, Python, and R programming languages, and supports SQL, streaming data, machine learning, and graph processing. You’ll find it used by banks, telecommunications companies, games companies, governments, and all of the major tech giants such as Apple, Facebook, IBM, and Microsoft. Out of the box, Spark can run in a standalone cluster mode that simply requires the Apache Spark framework and a JVM on each machine in your cluster.

**Features**

* It helps to run an application in Hadoop cluster, up to 100 times faster in memory, and ten times faster on disk
* It offers lighting Fast Processing
* Support for Sophisticated Analytics
* Ability to Integrate with Hadoop and Existing Hadoop Data
* It provides built-in APIs in Java, Scala, or Python