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Improving the effectiveness of e-learning through the behavior of proactive e-learners using Big Data concepts

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Abstract

Big data is a term used to refer a large anthology of data sets which is a recent trend in research topics which has many challenges which may include collecting, analyzing and distributes vast amount of data to both public and private domains. Big data can be classified into structured and unstructured data. Structured data can be formatted and can be used in Database management systems and unstructured data can be used in social media and they will be in unformatted content. Big data has the efficiency of changing and make some revolutions in E-learning with the help of behavioral patterns given by the e-learners. The important feedback and data can be gathered from the learners with the help of Learning Management systems and learning content. This paper illuminates the benefits Big data that exordiums the e-learners professionals. Big data concepts can be implemented to the e-learning technologies and also in can assist for the development of learning for both learners and teachers. The Big Data also makes a very greater significant in the e-learning industry. Learning Analytics also plays a significant role in Big data. This paper enlightens the challenges and importance of Big data and the reasons which may transfigure the e-learning diligence.

Keywords – Big Data, E-learning, Learning Management System-learners, Learning Analytics, anthology

INTRODUCTION

Big Data, a highly innovative provides a unique forum for world-class research exploring the challenges and opportunities in collecting, analyzing, and disseminating vast amounts of data, including data science, big data infrastructure and analytics, and pervasive computing (Vasant Dhar,2012). Big Data has become a very important factor in many organizations both which collects immense amount of information which are very domain, which enclose valuable information about problems such as national intellect, detecting fraudulent , bio informatics and advertising. E-learning is an education via the Internet, network, or standalone computer. E-learning is basically the network enabled convey of skills and knowledge. (Devajit Mahanta, Majidul Ahmed, 2012) Big Data Analytics and Deep Learning are two important factors in data science. There are many benefits for e-learning professionals who use Big Data.It becomes very imperative to be aware of how Big data can be used when it comes to E-learning. Big data provides an incredible an efficient way for the e-learner's instructors to gain knowledge about the process and obtaining data, information regarding people.

WHAT IS BIG DATA?

Big data is a broad term which refers to a voluminous data which may be either structured or unstructured data. But the amount of data doesn't matter. Only the analyzing and processing of data matters. There are many challenges in Big data which may include collecting, gathering, analyzing, sharing, visualizing, searching and so on. The term often refers simply to the use of predictive analytics or certain other advanced methods to extract value from data, and seldom to a particular size of data set, (Wikipedia).

FIVE V'S OF BIG DATA

Volume

Volume refers to the data which is engendered each and every second in a gigantic quantity .All the messages that we generate in Facebook,Twitter,Video clips, Pictures are not just in terabytes other than they are all in zettabytes and brontobytes of information and data. Per day we are sending 15 billion messages only on face book. With the technology available in Big data we can able to accumulate large amount of data sets in different locations which is connected by different networks.

Velocity

This refers to the swiftness of the data which is generated newly and the promptness in which the data move about. If you just imagine the messages that move around in social media in minutes and the alacrity in which the credit card and debit card transactions are made. Only with the technology available in Big Data this is possible

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Variety

This refers to the diversity of the data we use in database, tables, photos, videos etc.With the help of the technology available in Big Data we can merge together all the types of data in a structured way. Dealing with a variety of structured and unstructured data greatly increases the complexity of both storing and analyzing Big Data.(Alex.H, 2013)

Veracity

Veracity is about the analyzing the data about its abnormality that is found Veracity is a biggest challenge when compared to volume and veracity.

Value

Value is one of the significant factors in Big data. There will be no use in if we cannot acquire the value from the data after spending lots and lots of money for building the IT infrastructure to store all the Big data. Certainly it is true that if in the past we were storing data about groups of customers and are now storing data about each customer individually then the granularity of our findings is much finer and we approach that desired end-goal of offering each customer a personalization-of-one in their experience with us.(BillVorhies, 2016)

CHALLENGES IN BIG DATA

Storage

Though the data generated in education is not as large as all the data generated through internet, it is large enough, and would get much larger in future. (Katrina Sin, Loganathan Muthu, 2015)

The system which is now used is the old RBMS tools which is not enough to store and process the data like Big data. This challenge can be overcome by the compression strategy which will shrink the data which are idle and also in memory.

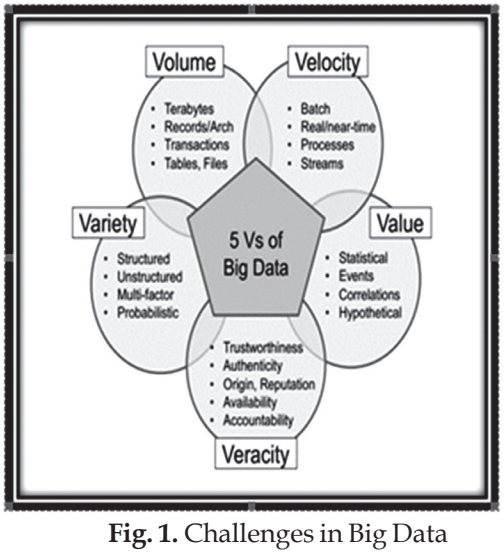

Fig. 1. Challenges in Big Data

Analysis:

When the data generated to the form of online learning websites and modules in a structured way, when the size of the data is too voluminous, we have to spend lot of time and possessions for analyzing the data. To overcome this, scaled out architectures are used to process the data in a distributed manner. Data are split into smaller pieces and processed in a vast number of computers available throughout the network and the processed data is aggregated. (Katrina Sin, Loganathan Muthu, 2015)

Reporting

Traditional reports involve display of statistical data in the form of numbers. When large amount of data are involved, traditional reports become difficult to interpret by human beings. In those cases the reports need to be represented in a form that can be easily recognized by looking into them. The Big Data technologies overcome these challenges using various techniques.

HOW BIG DATA RESHAPE E-LEARNING?

Big data is now reshaping the e-learning industry in which it is used to design, develop and deliver the learning content. The new technological revolution that is brought by the Big data to the e-learning has facilitated enormous way to make e-learning more and more effective. The e-learners can make use of the learning programs in a customized way.

Big data has so much of efficiency in such a way that we would have never imagined to modify and tackle the principles of learning. Learning that initially started in the class room was based on three models namely behavioral, cognitive and constructivist models. (Peggy A. Ertmer and Timothy J. Newby, 1993)

When Big data becomes a complicated issue in e-learning and higher education, many tools are being examined and used and they are collected from learning management system and strategies.

Big data concepts and analytics can be applied to a variety of higher education administrative and instructional applications, including recruitment and admissions processing, financial planning, donor tracking, and student performance monitoring. (Anthony G. Picciano, 2012)

HOW TO DEAL WITH DATA IN E- LEARNING?

Everything is all about "Big Data" instead of RAM-scale data. This is how the predictive learning of relationships between knowledge concepts and business events is done (Tavo De León, 2014)

Big data is the management of data and a type of measuring and analyzing the data. Hadoop and

Database Management System are being used in database Analytics.

BIG DATA, IMPACTING THE FUTURE OF E-LEARNING

The E-learning offers feedback from the E-learners and also allow the designers to design the E-learning courses and modules in their personalized way. The E-learning professional s can also track the prototype of the E-learners.

While online surveys and discussions may offer feedback regarding the effectiveness of eLearning courses and modules, big data gives to eLearning professionals the chance to receive invaluable feedback that can be used to pinpoint where the learner, and the eLearning course itself, may need to be improved. (Christopher Pappas, 2014)

Big Data can help us understand the real patterns of our learners more effectively because it allows us to track a learner's experience in an *e-Learning course.* (elearningindustry.com)

LEARNING ANALYTICS

When the data about learning quantity increases, proportionally the challenges for organizing the data also becomes increases to analyze the enormous data sets. In the e-learning industry, big data refers to the data obtained about individuals as they are involved in the learning process. (Sarah Smith, 2015)

ADVANCEMENT IN E-LEARNING WITH BIG DATA

When people in E-learning Industry, starts read the content, they start to establish the Big data. This data can be collected and analyzed with the help of Learning Management System (LMS). Today, Big Data be executed and analyzed, and can be used for E-learning.

The good news is that we've come a long way for the origin of the term Big Data. Today, Big Data be processed and analyzed, which is especially helpful for the e-Learning industry (Christie Wroten, 2013)

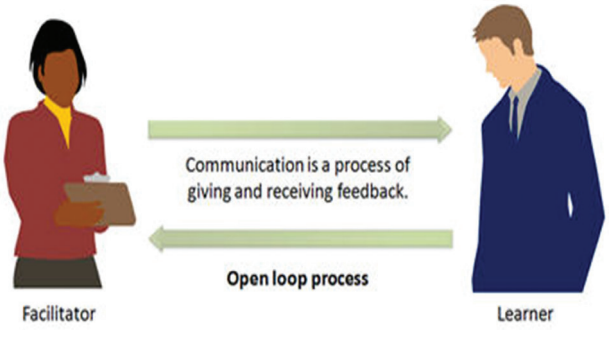

Fig. 2. Open Loop Process

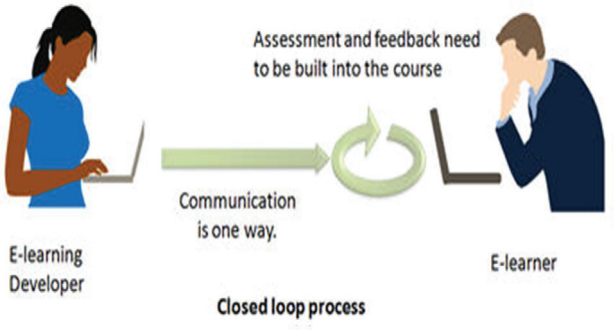

Fig. 3. Closed Loop Process

With the hindrance of E-learning professionals can be able to easily track an E-learner about the learning process that goes on from the commencement of the E-learning course module till the end of the course. We can also check for the skill and the efficiency of the individual E-learner.

THE PROSPECTIVE OF LEARNING ANALYTICS AND BIG DATA

The understanding of Big Data is mainly very important. In order to determine the best strategy for a company it is essential that the data that you are counting on must be properly analyzed.

Big data, in terms of the eLearning industry, is the data that is created by learners while they are taking an eLearning course or training module. With the learning task in a large dataset, the number of hidden nodes within the network will therefore increase significantly, which eventually leads to an exponential rise in computational complexity (Omar Y. Al-Jarrah, Paul D. Yoo, , Sami Muhaidat, George K. Karagiannidis, and Kamal Taha, 2015)

In recent years, there has been a big push for learning institutions to interpret student experience using the data they produce, so instruction can be individualized for student needs and student performance can be predicted in future planning effort.(Czerkawski, 2013)

PREDICTION OF STUDENT SUCCESS THROUGH LEARNING ANALYTICS

Learning analytics provides one of many methods to not only document student performance but also to endow with tools that encourage the types of continuous improvement that accredit bodies are seeking. On a more national level, institutions of higher education are experiencing greater demands to retain students.

With the digital age we have seen the exponential growth of data and with it the potential to analyze data patterns to assist in determining possible factors that may improve the learner's success. However, the challenge is to determine which data are of interest.

(Patricia Charlton, Manolis Mavrikisand Demetra Katsifli, 2013)

Learning Analytics endow with number of tools that help the students to learn and also the educational institutions apart from providing many strategies to improve the performance of the students. SNAPP, LOCO, BEESTAR, INSIGHT are some of the software available for Learning Analytics.

Benefits of big data in E-learning

1. Improved Education
Can improve students' performance and learning abilities making the lessons more personal. The courses can be adjusted from the teachers with the help of analytics

2. Matching students to programs
Open Data are able to help parents and students to find the best school or educational program.

3. Matching students to employment
Companies and candidate employees can discover alternative and more effective tools to use open data to qualify their skills with the needed skills. Also students can find and make applications for jobs which can match with their abilities, more efficient than before.

4. Transparent educationfinancing
This leaves to students to participate in education activities, which previously they don't have the ability. Furthermore are able to choose anything about higher education and to discover the most proper education programs for them

5. Efficient system administration
School education systems are able to develop a skillful school supply which can help administrators to allow more affective education resources. In that way this secures a high performance and afford to a versatile and smart plan for future education interests.

BENEFITS THAT BIG DATA OFFER TO LEARNING PROFESSIONALS

The following are some of the benefits of Big data in E-learning:

Using Big data the E-learners can acquire the Knowledge of understanding the E-learning training courses. Even the links can be shared with other E-learners once the data is received.

Big data allows the E-learning trainers to know how enable them to observe the regions where they need to

Table 1. Benefits of Big Data and Open Data in Education

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tweaked-up within the E-learning components and the way in which learners are assimilate the information.

By *tracking Big Data in e-Learning*, we can see which parts are too easy and which parts are so difficult that they got stuck. Some other parts of the journey we can track and analyze are pages they revisit often, sections they recommend to peers, learning styles they prefer and the time of day they learn the best. (Christie Wroten, 2013)

CONCLUSION

There are number of potential and promising technologies in Big data to facilitate the E-learning industry and the E-learners. The impending technology that is within the Big data revolutionize the learning approach and also the progress in education by challenging some of the ideas and the way of thinking and designing the structure of learning education. The new solution and strategies in Big Data may harness the conventional model to design the E-learning processes that are even followed currently. The Big data also plays a vital role in modifying the skills and practice of learning. The trainers and the instructors can easily understand and get the knowledge of what type of functionalities that is going on and it also allows them to improve and enhance the experience of learning.

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