

BIG DATA ANALYTICS IN HIGHER EDUCATION AND APPLICATION OF CROWD SOURCING

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Abstract:

In the era of data management for information systems specially in the area of Higher education, Big Data and Big Data Analytics (BDA) has come handy making it more exploratory. Learning Analytics utilizing Big Data has seen a rise steadily, with ubiquity and ease of computing as the encouraging factors. The digital data being created by the higher education institutions (HEI) is also on ascent. The need for using “Big Data” platforms to handle, analyse this large amount of data is increasing. Many educational institutions are using analytics to improve their processes. Big Data analytics when applied onto teaching learning process might help in improvising as well as developing new paradigms. The purpose of this paper is to throw light on how Learning Analytics along with Big Data and Crowdsourcing can render education in a more personalized way to each student and create a fairer and more sociable environment for learners.

Keywords: Big Data, Big Data Analytics, Higher Education, Crowd Sourcing

I. INTRODUCTION

With the rapid development of digital computing devices and Internet, a huge amount of data belonging to the public domain is generated and processed on daily basis today. This massive amount of data, rightly termed as “Big Data” is analysed through efficient techniques and algorithms under “Big Data Analytics” to provide comprehensive real-time information pertaining to rising trends so that early measures can be developed to meet the challenges and demands of today[1]. The measure of accessible information in various businesses is additionally extraordinary. Enormous Data which can be characterized as "Large Data" is a developing and rising term that portrays any voluminous measure of information in organized, semi structured or unstructured frame which has the anticipated power and potential to be dug for learning and data against future angles.

Big Data Analytics in the educational field is rapidly producing novel possibilities for collecting, interpreting and presenting student as well as course data which institutions can be able to employ these new data sources as beckons for redesigning course material and as proof for creating new tests and directions of communication between students and management.

Big Data Analytics in the education field can be said as Big Learning Analytics (BLA) in which state-of-the-art devices are brought into to enhance teaching learning process. Learning analytics is aligned with similar areas of studies such as academic analytics, web analytics, business intelligence, decision-making and action-oriented analytics.

BDA examines huge size data to unearth hidden patterns, finding out correlations and other details. It is possible with today's technology to analyze one's data and obtain answers from them quickly. However, such effort with traditional business intelligence techniques might be slower and so less efficient. Henceforth, the emerging concept of Crowdsourcing is also an alternative to such data analytics techniques as crowdsourcing play a crucial role in boosting the motivation to involve many minds to contribute to the development, analysis and exploring the insights of the Big Data.

This paper aims to briefly tell about the emerging learning analytics-driven educational technologies that seek to triumph over the challenge of individual students' learning needs by embracing different elements of personalized learning.

II. LITERATURE REVIEW

An intrinsic connection has been shown between learning analytics and big data. although work in this arena is still going on. Areas focusing on the enhancement of learning analytics modalities are certainly growing. It was predicted that learning analytics – showing directions to better students' participation and offering premier quality, personalized education to pupils – are poised to be widely embraced. Taking advantage of the demographic information of students, the confluence of learning analytics and big data is poised to revolutionize the educational field. [4] The problems of success ratio and retention could be analyzed, making imparting of instructions more personalized. Students could get effective tools to think about their own learning methods. Hence concealed practices like behaviour and attitude about online discussions could be brought out into the open and measured, although the spectrum of students being exposed to learning analytics is still in its infancy.

III. BIG DATA ANALYTICS - FOR EDUCATION SECTOR

The environment of higher education is transforming to cater the changing learning needs and diversity of students. Global changes like advancement, availability and ease in use of technology has steered the change in higher education.

Education sector is one of the areas which has drawn attention where Big Data analytics is found much helpful and effective. Analytics through big data has many dimensions and ranges too for the better result and research recommendations. The steady assessment because of data variety and the volume forces management to look

upon to it and have some betterment in their work and processes [5]. Educational institutes deliver substantial volume of information which should be inspected and seen through to maintain in a competitive environment. Educational institutes may have diverse areas or factors of Big Data analytics as given in the below figure:

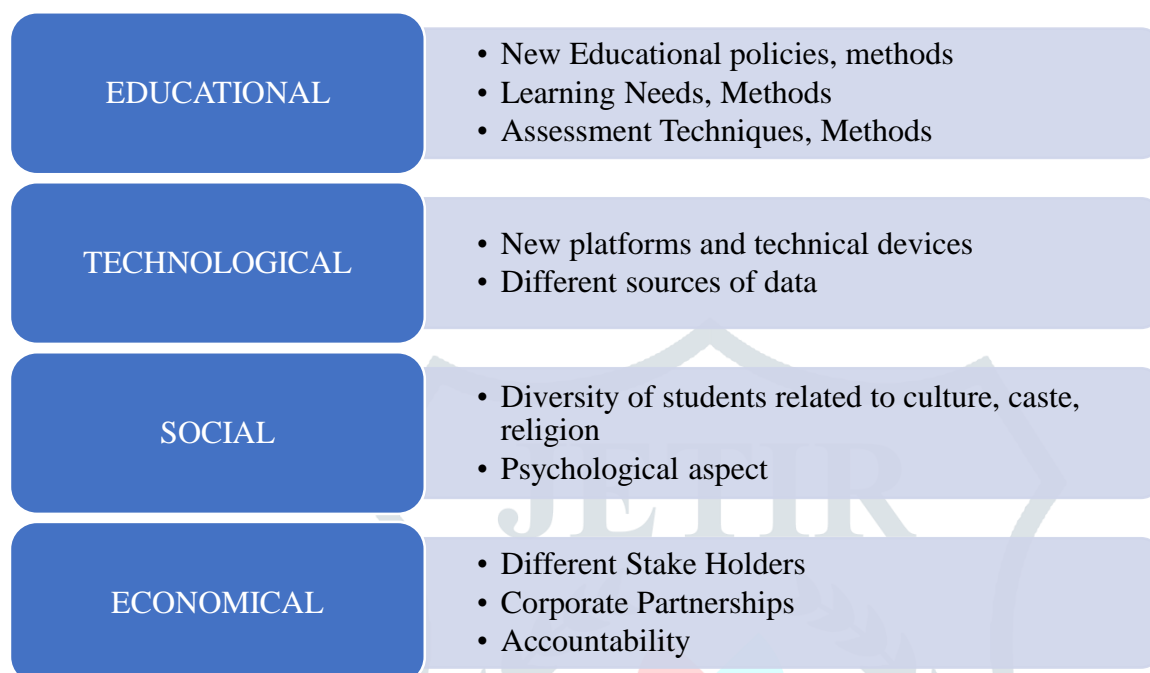


Figure: Factors affecting Big Data Analytics in Higher Education

The two major areas of Analytics which can be applied for the Higher Education and institutions are: Teaching Learning Analytics and Academic Analytics.

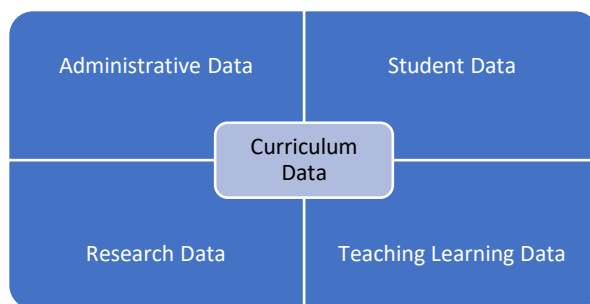
(i) Teaching Learning Analytics

For the most part these analytics concentrates on the effectiveness of leaning approach of the learners. It is concerned with the data about learners which is to be collected, analyzed and reported. These analytics uses data about learners for understanding and optimizing learning environment.

(ii) Academic Analytics

These analytics concentrates on general change in scholastics of the institution. It manages the authoritative procedures, work processes etc. It utilizes the information about staff, management, scholastic people.

Accessible information of various reason and nature are accessible however educational institute and they might be used with a solitary and basic goal. These assortments of information that may advance through instructive foundation are appeared in following figure.

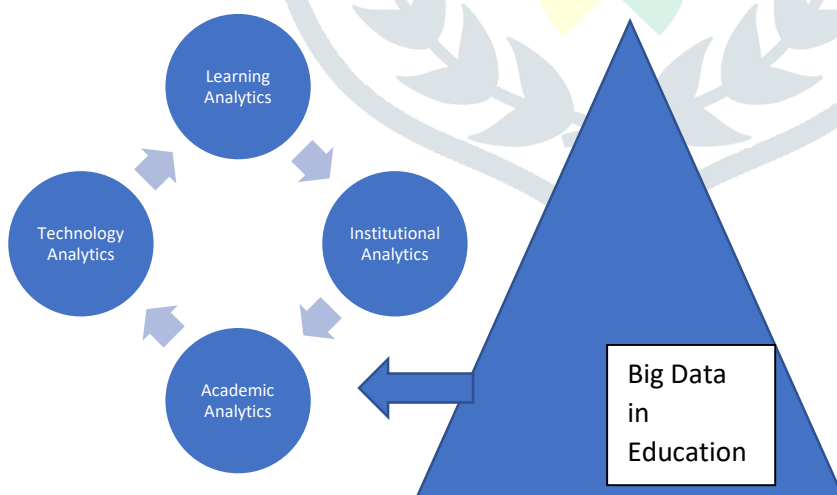


Opportunities are plenty for big data analytics in education. Students, faculties, administrators, management, educationalist may get avail with such opportunities. Identified opportunities can be said as follows:

- a. Risk associated with learning and scholastics can be lessened at abnormal state for the advancement in general working.
- b. High achievement proportion can be accomplished by keeping up smooth processes outlining the work and information stream.
- c. Collaborative approach can be done to enable the association with enterprises and foundations.

IV. APPLICABLE FRAMEWORK

Big Data analytics results guarantees that some important choices can be removed from the efforts deployed on the huge amount of data. Actionable information can be gathered or expected as a result of this analytics. As of late, big data analytics influence higher education at a very high extent to achieve effective and evidence based strategic decision making. Big Data settles on this basic leadership process practical by utilization of a proposed structure model [3].



(i) Institutional analytics

Institutional Analytics is for the most part utilized for decision making improvement at institute level. It utilizes a huge assortment of operational data for policy assessment analytics, instructional analysis and

structural analytics It makes utilization of reports to decide on information and giving the driving choice over the whole foundation.

(ii) IT analytics

It coordinates data from various sources to screen technological effect over the execution of the institutional process. It analyzes the data and identifies the need of technology at different levels of institute processes, required technological tools for betterment in process flows, required and suggested mechanism for information flow with the aid of Information Technology.

(iii) Academic Analytics

The fundamental data analytics in the education sector is academic analytics. Academic analytics covers wide array of exercises of advanced education. Such exercises may influence resource usage and designation, resource administration, administrative task, research and so on [3]. Mostly academic analytics consolidate large data sets to enhance basic decision-making process and furthermore strategies to compare with other institutions.

(iv) Learning Analytics

Information about learners and its context are gathered to comprehend and enhance teaching learning condition in learning analytics. Learning analytics software is normally utilized for enhancing procedures and work processes, measuring scholastic and institutional information to enhance authoritative viability [3].

V. CROWDSOURCING and BIG DATA ANALYTICS

Big data analytics requires data cleansing, transformation, moderation and management which can be assigned to Crowdsourcing. It is an innovative method since humans can moderate the content, analyze the sentiments from feedback (sentiment analysis), review, feedback and comment at a speed which is of admiration. It can provide better meaningful insights compared to a machine [6]. Crowdsourced approach provides new insights into the heart of contemporary educational values, free from infrastructural, political or administrative concerns.

One example could be from the individual learner category, that, employing a crowdsourcing methodology might facilitate the collection of data that is independent of institutional forces [7].

VI. REFERENCES

- [1] Ben Daniel ,”Big Data and analytics in higher education: opportunities and challenges” , British journal of educational technology 2014.
- [2] D. S. S. E. J. C. Samson OluwaseunFadiya, "Big Data in Education; Future Technology Integration," THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE, pp. 65-69, 2014.
- [3] B. Daniel, "Big Data and analytics in higher education: Opportunities and challenges," British Journal of Educational Technology, pp. 1-17, 2014.
- [4] M. F. M. F. Marie Bienkowski, Enhancing Teaching and Learning Through Educational Data Mining and Learning Analytics: An Issue Brief, Washington, D.C., 2012.
- [5] P. B. D. D. G. O. John P. Campbell, "Open Learning Analytics: an integrated & modularized platform," EDUCAUSE Review, vol. 42, no. 4, p. 53–54, 2007.
- [6] <https://www.digitalindia.gov.in/writereaddata/files/BIG%20DATA%20ANALYTICS-2%205.pdf>
- [7] Spaces and Pedagogies: New Zealand Tertiary Learning and Teaching Conference 2017 Proceedings

