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Big Data Analytics : A Catalyst for re-energizing LIS Education

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Purpose – The purpose of writing this paper is to explore a new additive approach to LIS education system. Library professionals can taps this golden opportunity of using Big Data Analytics to learning the key role of the data scientist in their academic programs. They need to be well versed with some acquired competencies such as domain expertise, data management, data warehousing, statisticians machine language and analytical expertise. For walking through the digital path, we need to acquire skills of data literacy for revitalizing traditional librarianship. This is a current need for library and information specialists is to be fully aware of the new "Data Dimensions" of their task, and this undeniably accounts to a new role for librarian professionals in line with the theme of this unique issue.

Methodology – The design of this paper is based on the overall development of data analytics and data science course with the rise of increasing importance of big data analytics field. It will cover all topics related to data and its various representation such as digital data, raw data, unstructured data, metadata, data mining, data cleaning, manipulation analysis and data visualization.

Findings – The course will give a strong platform to the library professionals for establishing them as a more competent information professionals. Through this additive approach, a basic grounding in library science is extended further which gives an opportunity to study a new area of professional operation for continuing learning.

Keywords- Big data analytics, Big Librarianship, Data Scientist.

Introduction

There is a consistent buzz about big data, which is the result of the complex advanced age. Abundant of information delivered day by day out of which just 0.05% information is being broke down. Huge information is a term utilized for colossal informational indexes having extraordinary, increasingly variegated and compound structure with the inconvenience of putting

away, investigating and imagining for further practices. The tsunami of big data will be "Next frontier for innovation, competition and productivity"(Manyika et al., 2011), thus these circumstances make totally new pictures in numerous enterprises including instruction as the interest of enormous information examination or information researcher. As indicated by Loebbecke and Picot "There is currently no uncertainty that cutting edge figuring, all the more explicitly enormous information examination (BDA) and information science (DS) will profoundly affect ventures, foundations, and generally employments."Big data analytics is a process of research into huge amounts of data to unveil hidden patterns and unknown connections.

Big data analytics is the way toward breaking down information to uncover designs utilizing registering calculations, programming and measurable demonstrating methods for discovering profitable and convenient connections. Investigation is the trailblazing venture of present day registering situation. Learning analytics alludes to the way toward gathering, assessing, breaking down, and detailing authoritative information for basic leadership (Campbell and Oblinger, 2007). For a superior comprehension and improvement in the execution of instructive foundation in instructive conveyance enormous information examination is unavoidable.

Davenport and Patil, (2012), mentioned that data scientist is the sexiest job of 21st century, before we dwell deep into the details of data science, an understanding of data scientist as a professionals is must, “Data scientist is the person who is better at statistics than any other software engineer and better at software engineering than any other statistician”.

Considering the fact that every industry is posed by challenge of managing huge amount of data, hereby in this paper we would emphasis on two aspects i.e Big librarianship and LIS education considering the presence of big data analytics. In terms of the futuristic approach, it is the right time to recognize the need of data scientists in library system to create competent librarians.

This paper suggests an innovative approach towards LIS education system, relevance of big data and new avenues to its patrons for future associations. It will wisely club our traditional librarianship with predictive modelers, statisticians, computer analytics and typical data scientists.

"Librarians should first focus on collecting data from network and readers and then reducing and compressing the redundant data" (Lawton and Burns, 2015). As indicated by Jun Li et al., (2017), the enormous information period, librarians ought to be acquainted with different system look instruments and hunt methodologies, and react to peruser's inquiries viably and convenient. They further included that the abilities of librarians are critical to gather information and direct the enormous information examination. Subsequently, applying huge information in libraries may compel administrators to improve their aptitudes." Big information examination is a rising field and fills in as an establishment stone for further investigation of numerous potential issues identified with tremendous information the board and extraction. In this manner, the nearness of Big information examination has enormously influenced the job of customary librarians ..

To evolve from conventional librarian to big librarianship we need skilled data librarian equipped with big data analytics and management competency for our society. As Kirkwood (2016) has rightly quoted “Data are nothing without analysis, and many librarians currently lack the data fluency to work confidently in a world of dynamic content creation”. He suggests that “Librarians need both to re-skill and to change their self- identification and the philosophy that underlies it, if they are to achieve confidant data fluency”.

The Big chaos of Big data

In the course of the most recent couple of years, because of an expanding request, enormous information has picked up a ton of significance and acknowledgment, it is no big surprise that a worldwide big data market developing altogether (Waller and Fawcett, 2013; Manyika et al., 2011). In one of the paper released by a scientist of NASA, the term “big data” was used for the first time. In that paper, they have described the problem with appropriate visualization (computer graphics), providing an interesting challenge for the computer systems. As a result of different digital initiatives definition of big data and its shape has changed number of times

There have been many scholarly papers which continue discussing and defining big data. . As per the Oxford English dictionary Big data is “data of a very large size, typically to the extent that its manipulation and management present significant logistical challenges”. Characterizing big data has never been simple for researchers. Strong (2014) pointed that big data is a "more extensive social marvel" rather than a unique thought. Trombley (2015) audit the nitty gritty elements of big data, for example, velocity, volume, veracity, and value.. Bumblauskas et al. (2017) additionally characterized that "Enormous Data is a questionable and adaptably characterized term regularly connected with the accumulation and examination of 'vast' datasets". as of now, the marvel of enormous information has just been uncovered and its attributes are distinguished plainly.

Presently a days we are utilizing, trading and putting away the majority of data in different arrangements, for example, email, long range informal communication, texting communitarian intranets and extranets, open sites, Wikipedia, websites, video, sound records information and by numerous different stages. This unstructured information means as much as 85% of the data that organizations store. Enormous information is a powerful issue of each industry paying little respect to the extent of business. The capacity to bring out high legitimacy from this information, empower advancement and aggressive addition is the motivation behind enormous big data analytics. To break down these substantial arrangements of information, business clients and specialists can see examples and patterns in execution, watch new relations between informational indexes and potential new wellsprings of income.

Big data analytics Need

As indicated by the exploration of Read et al. (2015), there are constant phase of difficulties when we start a new service in library.Tenopir et al. (2014) found that numerous LIS experts give the information benefits by utilizing the augmentation of conventional library

administrations, however some of them are progressively engaged with helping the library clients by creating the arrangement of information the board and association. Read et al. (2015) also recommended that the essential goal is to improve the productivity and viability of the institutional approach by utilizing information analysis to enable colleges to deliver rising issues identified with low standards for dependability and progressively broadened periods. By determining the difficulties of Big Data analytics, Katal et al. (2013) guaranteed that volume, speed, assortment and veracity are the four components of Big Data. Other than this, DeVan (2016) study uncovered the three more dimension of Big Data with "inconstancy," the mixes of steady information changing could have an massive effect on the homogenization of information. the visualization of data in charts, graphs and the value of orgainizational data are integrated challenges of analytics.The converging of the information is troublesome in the wake of bringing from the various sources. In library (Goldberg et al., 2014), the sorts of information change drastically and different volumes of the information must be sorted out and upheld to empower the various service of the library. Due to the digital surrondings, the necessities of the library clients will persistently develop later on (Showers, 2014). Librarians ought to be able to identify with the creation, the executives furthermore, conservation of information (Semeler et al., 2017). The job of custodians is fundamental for Big data analytics, so there is a need to improve the aptitudes and learning of library and information science professionals for the usage of Big Data analytics. Xie and Fox (2017) contended that for the application of Big Data analytics, the library experts don't such expertise and skill to give new esteem and upgrade services. In this unique circumstance, the exploration of Atkinson (2018) uncovers that there is a need of customer centric methodology for LIS experts to be progressively coordinated into the scholastic procedure and to comprehend and understand various periods of research-based necessities of library clients.

Need of learning Data Analytics in Library

As anticipated by McKinsey Global Institute (Violino, 2014), a deficiency of 140,000-190,000 information researchers and an absence of 1.5 million supervisors with diagnostic basic leadership capacity by end of this current year has made a feeling of earnestness to bring people gifted up in big data management and analytics. In one meeting Davenport (2017) has referenced "McKinsey said a couple of years back that in the USA alone there was a requirement for 1.5 million "information keen directors". We are off by a long shot to building up that number up until now. Be that as it may, there are more than 100-degree programs in analytics and information science that have jumped up in the course of the most recent few years in the USA alone".

Numerous advanced education establishments are progressively swinging to big data and analytics program to give one of a kind knowledge and prescriptive comprehension of information (Chen et al., 2012; Siemens and Long, 2011). We can see it obviously there is an extraordinary interest for college graduates who can work with information definitively, in this way the required push by industry for big data and analytics related educational modules. According to Waqar, 2017 "IBM is objectively working with thousands of universities to create a big data curriculum. IBM also advises librarians to understand the modern trends and enhance their information searching, managing and analyzing skills".

Numerous colleges receiving big data analytics educational modules in their degree courses. With the expansion in the quantity of colleges offering degrees identified with data analytics, the educational programs given by SAP University Alliances keeps on developing and change to coordinate the instructive and business markets (McLeod, 2017).

The need of great importance is to change the educational modules and pursue big data analytics esearch and educational modules improvement as a plan. As big data analytics fortify an association's competency to settle on proactive choices, in excess of 75 percent of organizations are looking or intending to put resources into big data in the up and coming years (Gartner, 2015). Much has been done about Big Data in the private part (counting retail and business investigation), though the open segment and the advanced education field appear to need behind (Nils and Berg, 2015).

Being a point of reference for massive informational indexes, big data includes gathering understandable masses of information and discovering patterns inside the information enables the organizations to move further quickly, easily and productively. This likewise gives an understanding to dispose of zones before those already subtle issues pull their benefits or notoriety through the famous mud.

Moving towards Big Librarianship with updated LIS Curriculum

In the modern, fast paced competitive world librarian needs to understand how to transform analyze and present data for meaningful knowledge creation. Major challenges they may face would include making big data sets more useful, visible and accessible. To attain this objective researcher or user can look at data in new way and mine it for information, they have via big data analytics. It is seen that Library and data the executives experts are appropriate possibility for the places of information researcher. Krämer and Senner (2015) expressed that librarians as information researchers should know about programming for the handling of enormous geospatial information. They will require learning of programming frameworks and design of big data (Dutta, 2015).

Various scientists have examined the utilization of Big Data in different fields concerning its pertinence, information accessibility, cost, ability, security, significance, and proprietorship (Bates et al., 2014). Notwithstanding, without a doubt, not many productions and industry report expressly address the integrative utilization of Big Data in advanced education (Bienkowski et al., 2012; Chen, 2014; Daniel, 2015). We ought to investigate the procedure of educational modules selection and utilization to perceive how school programs are evolving. We more likely than not pursued enormous information and investigation research and educational modules advancement plan near an end. Accordingly, Big Data is an undiscovered open door for foundations in the region of advanced education.

Required Skill Competencies for Library Data Scientist

We all know the strength of an ideal information scientist in the library context. While Imagining a completely new breed of librarians, which are developed by acquiring necessary skills of data

science, we will have an improved and more competent group of information professionals. LIS experts may quicken their profession in information science, acing the ideas of information the board, insights, AI and enormous information science for vocation development (Baskarada and Koronios, 2017). As indicated by Davenport, computational, systematic, correspondence, and business aptitudes are especially sought after for the job of information researcher.

big data analytics and data science preparing projects, courses, and educational program will be sorted out so that understudies will communicate with a variety of masters giving them a sufficiently expansive image of the big data scene. The multidisciplinary idea of examination and Data Science requires returning to instructive models by creating experiential learning and executing another educational methodology. The consideration of researchers is required as there exists a variety of unexplored research regions. This new methodology will cross over any barrier among education and the business.

Here, we are trying to identify some mandatory fields in which information professionals need to be competent for coping up with big data analytics environment. Presently a number of Indian universities are providing data science specialization courses for students and professionals. After a comprehensive analysis of job profile, competency requirements of present information professionals and area of data expertise, it is identified to focus on some of the computing analytics program, which is already popular in data science courses.

- **Data Management**

  Data scientist must be well versed in various languages of data science and data management. They need to learn all required tools and languages related to data analysis like R, Excel, SQL, Python, and Tableau. They likewise should have competency in a bunch and distributed computing so as to execute and improve (for example with regards to real time analytics) preparing (for example arranging, amassing, looking, coordinating, and connecting) and examination of huge datasets. These modules are required to incorporate into the preliminary course.

  Data Warehousing and OLAP

  A person needs to have expertise with the knowledge to extract and pre-process data before analysis. Data Preparation includes how to prepare data before its analyze.

- **Data Visualization**

  It makes the data alive with visuals using R and other tools like Tableau, hence it is also a part of data analysis. In descriptive Statistics, we learn to summarize and describe data sets using measures like Central tendency and variability and in Inferential Statistics.

  We learn probability, Central Limit Theorem and much more to draw inferences. In Exploratory Data Analysis, we derive initial insights from the data using R and other

visualization tools. In Hypothesis Testing, we understand how to formulate & test hypotheses to solve various problems.

- **Machine language.**

  Machine language is very important for the data analysis. In Linear Regression, we learn to implement linear regression and predict continuous data values. In Classification, we understand and implement algorithms like K-NN*, Naive Bayes. In logistic Regression Clustering, we learn how to create segments based on similarities using K-Means and Hierarchical clustering. It Helps a telecom giant predict if a customer will churn or not. It apply multiple algorithms simultaneously to see which one works the best

- **Big data analytics.**

  Introduction to Big Data And Hadoop. Understand the basic concepts of Big Data and Hadoop as processing platforms for Big Data, Managing Big Data, Learn and Use Hadoop Ecosystem tools for data ingestion, extraction, and management. Hadoop ecosystem tools namely Sqoop, Hive.

- **Introduction to Spark**

  Understand and use Spark, a fast Big Data processing platform, Big Data analysis, Learn how to analyze Big Data using Spark R, Spark SQL, DOMAIN ELECTIVES**.** BFS help to learn Customer analytics and Risk Analytics within BFS. In e-Commerce, we learn customer marketing analytics and recommendations engines

Big Data Analytics and LIS Education

Because of an expanding interest for analytics, it is seen that the worldwide Big Data Analytics advertise is developing fundamentally. In 2015, for instance, the market developed by 31.4 percent, achieving now $4.50 billion on a worldwide scale (Frost and Sullivan, 2015). Therefore, a vocation as an information researcher is considered as a standout amongst the most alluring employments of the twenty-first century (Davenport and Patil, 2012).

The proposed change in the LIS course curriculum can fill the basic gap by examining the applicability of Big Data analytics in LIS education system. Today, we are living in a digital era and thus we are surrounded by a volume of data, which is continuously produced with a rapid rate. Our library is becoming digital library and library professionals are becoming information or data scientists. In my opinion, a library professional is one of the most important people who is continuously dealing with data and information. Data analytics demands a different set of skills competencies, which needs to be enhanced by developing new LIS course curriculum.

Here, we are trying to tap the big opportunity which comes with big data analytics as a profession. This complete area of study proves to be one of the extensions of existing LIS programs.

Big data analytics opens the new door for LIS professionals to work as data expert and facilitator for the massive data sets. The mission of librarianship is to facilitate knowledge creation in communities and for creating the new knowledge we should be analyzed the data. The role of libraries and library personnel is to create information literacy, quality selection, information accessibility, Data analysis literacy.

Conclusion

"Big data analytics in training is of noteworthy premium and has increased high need for the vast majority of the advanced education establishments. Thus, the two LIS experts and scholastics see extraordinary chances to utilize Big Data in LIS education. In any case, most across the board scholastic examination are constrained to "reporting and compliance" just as "analysis and visualization" (Bichsel, 2012). Advanced education establishments gather and store a lot of information, yet they don't utilize them viably (Davenport and Patil, 2012). Along these lines, it is a dire necessity to create required capabilities among library experts to use enormous measure of generally unmanageable information. It will at last improve the efficiency of any scholarly or research establishment.

Big Data is a zone of quick development, and obviously with an huge potential to lead in advanced education towards another measurement. Be that as it may, perceiving a fitting Big Data stage which can incorporate with the current framework and procedures is as yet a noteworthy test for higher education establishments. Scholarly organization needs to organize activities which are important to change customary LIS training into an increasingly viable and adaptable, cutting edge for incredible learning.

In the period of data driven society, educational institution, public and private business associations and organizations are creating a lot of information. The data compitancies of LIS experts based on Big Data analytics encourage to find out emphasize of the analytics in libraries. Dealing with the immense and complex information is a biggest challenge for business and academic instituions. The connection between the capabilities and aptitudes of academic libraries for the usage of Big Data analytics is also analysed. The study conclude that LIS Professionals should have the understanding about the idea of Big Data analytics.

Big data analytics is the emerging trend throughout the world and at the same time it is the need of the hour to tap the skills related to it.Therefore , librarians need to understand the urgency to develop required skill to cope with it accordingly.The LIS professionals and experts need to engage themselves in big data related activities.They need to learn and share big data analytics related expertise ,techniques with their peers.Inspite of curriculam develpoment for LIS schools awereness about the structure and its implimentation of big data analytics should be created amoung LIS professionals.In order to proper implementation library can conduct workshop and

training program on big data analytics .this kind of practices surely improves the practices and usage of big data analytics in libraries.

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