E-GOVERNANCE IN INDIAN UNIVERSITIES USING BIG DATA

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Abstract—**The word digitalization is the process of loading, administration and searching of things in a fastest, easiest and safest way. The service offered by Indian government combined with some autonomous bodies to distinguish state university, central university, deemed university, affiliated college and autonomous institutions are all together as an Indian University regarding their whole complete process of university. E-governance is the use of ICT for planning, implementation and monitoring of government program, projects and activities. Big data handles the technology of capture, store, distribute, manage and analyses the larger size data sets. E-governance in Indian universities using big data tries to examine the perception of various requirements that of include computerization and management of process. This process is implemented through big data using Hadoop framework and the report is generated using big data analytical analysis.**

 Keywords-e-governance;hadoop framework; big data;big data analytics;

I. INTRODUCTION

Making all the services accessible to common man to ensure efficiency, transparency and reliability of such services the big data maximizes the e-governance and success in Indian University. The Student academic details, extra circular activities and other performance are tracked which results in the profile creation of the students for the creations of e-governance for student details. Data Management will help the Universities to access and control all the information that benefits the e-governance process.

The details are collected and the process of e-governance in central university, state university and private university,

Deemed University, Affiliated college and Autonomous Institutions for control of whole management of admission, academic, finance, funds, staff details, Library and development process are developed using Big data and centralized all these details as a single framework as a Indian University.

This paper examines the role of big data in Indian university. Big data is data which isfundamentally too big and moves the data too fast exceeding the processing capacity of conventional database systems [5]. Big data comes to identify the number of characteristic key among them are:

A. Volume

It refers to the large amount of data produced per second. With the help of big data the data can be stored in various locations and brought together by using the software.

B. Velocity

 It refers to speed for the new data set that is generated and also the data moves around without storing into the dataset.

C. Veracity

 It refers to the uncertainty in surrounding data that is caused due inconsistency and incompleteness of the data.

D. Variety

 It refers to the different types of the data set that is stored either structured data or unstructured data.

E. Value

 It refers to turning the data into value.In addition to the above key characteristic the three stages required for big data used in an organization.
The three essential stages of big data are
 1) Collection

Data collection is the first stage in big data. This identifies the data that exposes useful and valuable information. The data collected must be filtered for significant data and it should be stored in useful form, investing in huge amount of data collected are not important and the vast amount data are not the valuable data.

2) Analysis

Once the data reduced in a useful form it should be examined to generate actionable information. Managing and analyzing the data in a growing diversity of data is a very complex process. Analyzing need to be grasping the information thatneeds to be linking, connecting and correlating the different data sets. This process is termed as "complexity" in the reduced data set in big data.

3) Visualisation

The analyzed data in the big data is available to user in a well explained manner and combined into existing process. This serves as Decision making.
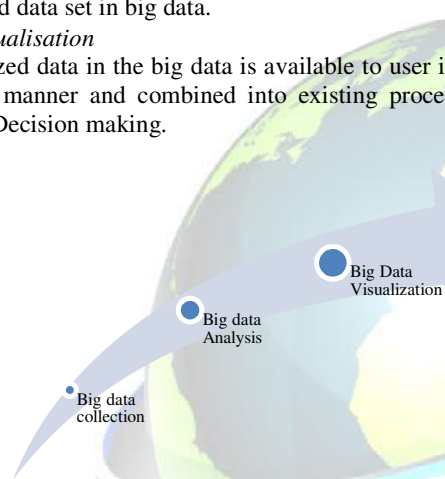

Figure 1. Stages of big data in organisation

II. E-GOVERNANCE AND BIG DATA

In India there are services offered by central and state government besides there are autonomous bodies to distinguish they are central university, state university, private university, Deemed University, affiliated college and Autonomous Institutions having variety of enrolment and requirements.The three categories of groups that are discerning in governance conceive are government, citizen, business or interest groups.

- Providing greater access to Indian University.
- Promoting civic engagement by enabling the public to interact with official of Indian Universities.
- Making universities more accountable by making its operation more transparent thus increasing the opportunities for rural to know about Indian university.
- Providing development opportunities especially benefiting rural and traditional undeserved communities.

E-governance is not about the software, hardware but about people and process. It is to support and simplify governance for government, citizen and businesses.

A. Big data in Indian university

E-governance in Indian universities using big data will enable various stakeholders to a cost effective with improved operational efficiency in various process approvals of college, certificates, rank holders, centralized e-library, report etc. for the student, staffs and the citizens.

The increased efficiency and transparency will help to satisfy not only to the student, staff and the citizen but also make create the tough competition to the foreign university.

- The duplication of procedure should be removed and a consolidate details about each universities and college should be collected made available to centralized database.
- The college or universities should submit the relevant information through online for the approval. This e-governance work reduces the duplication of record will increase the efficiency and available to all ground the people of India.

1) Need for Big data in Indian university

The effective utilization of common service to ensure efficiency, transparency and reliability by the citizen that reduces the time as compared with traditional based services. The successful implementation of e-governance in Indian university requires the effective utilization of process technology, data integration and financial budget.

a) Data sharing

- All the university details should be collected and should be centralized on their accordance.
- Entries about the colleges under state should be mentioned and the relevant details are clearly mentioned in order to avoid duplicate records so that user will be easily accessible.

b) Pesonalising/Grouping

- Connecting all the information from universities and colleges and the information's are grouped and made available to all staff, students and the citizen which provide all the information so it reduce the time and effective utilization of resource by people.
- The immediate fund allocation to the researcher should be transformed and the clear information of details about the project under the UGC should be delivered to both government and the citizen.

B.   Conceptuarial Framework for E-governance in Indian University

In India the service offered by State Government and Central Government provides various scheme related to the higher education and it should be made available through the Indian University.University is an institution of higher education which understand to cover teaching, research and education which provides undergraduates, post graduates of education which means of community of teachers and scholars. The university is commercial in natures to develop the use of higher education. One of the requirements of the framework of e-governance in Indian University is the understanding of various functional units. So, the components based on digitization of university are identified and their successful implementation is done through big data.
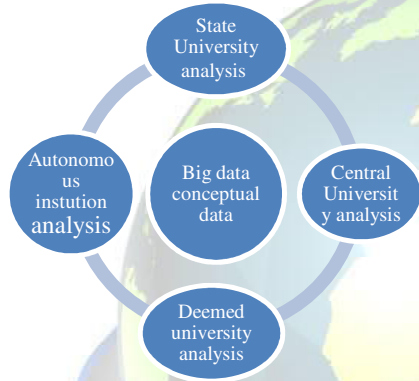

Figure 2.   Big Data Conceptual analysis

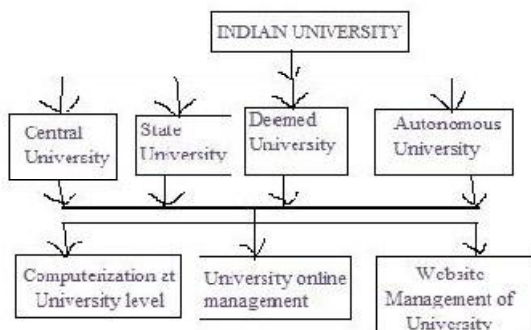Figure3.Provides the Roadmap for the university by leveraging ICT for the development of Indian University in India.

Figure 3.   E-governance Road Map

1)   Computerization at University Level

The computerization at university level can be developed that split into three levels i.e.) Student, Staff and the administration. Collecting all information and management is not an easy task which can be easily dealt with computerization. The following figure illustrates the computerization which is summarized here.
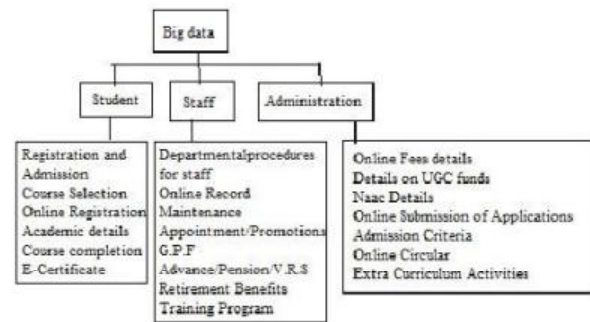

Figure 4.   Big data Opportunities for End user in Indian Universities

2)   University Online Management system

Online Management is the process of collecting and managing information from one or more source and made available to one or more audience.Management is the collection and control over the structuring, processing and delivering of information in Indian University. The management in Indian University includes

- Information about Rules and procedures under the UGC and the ministry
- Information about norms, rules, regulations and deadlines, legal issues relate to finance, course etc.
- Faculty information of all universities
- Course details/ syllabus Details
- Admission details about various universities like academic details, auto eligibility check, online submission of application forms etc.
- Library details like e-books, document etc.
- Academic Details.
- Extra curriculum activities like symposium, seminar, workshop, conference and alumni.
- Information about UGC fund allocation and other activity.
- Information about student award system in all universities.
- Establishment of information centre at each university and their affiliated colleges with resource, infrastructure, skill, awareness and the manpower.
- Interdepartmental collaboration details.

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- Inf ormation about instant statistical reports.
- Details about the Internal staff members and their details like G.P.F, advance, pension etc.
- Courses offered by the Universities and their affiliated college and fees details etc.
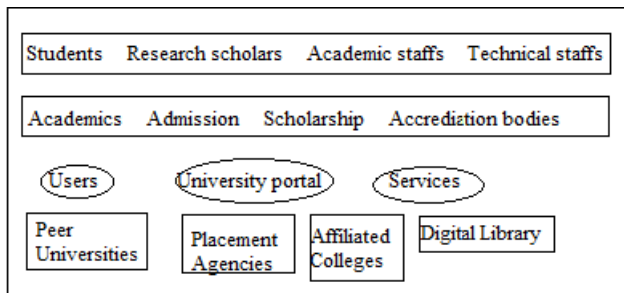

Figure 5.   Block Diagram for web based open portal

Figure5.Provide variety of services that will helpful in an interactive, informative, transactional and in an integrated system across the entire spectrum of the university sector.Central Universities, State Universities, Deemed Universities, Autonomous Colleges and the affiliated colleges will enter the data and provide the information to the regulating bodies. The collected data from various universities may be classified as follows:

- Student Details
- Staff Details
- Statistics of Student and Staff
- Institute Data
- Courses details
- Research Data
- Placement Data
- University Website Management system

This will serve information to stakeholders like student, staff, research scholars and other accreditation bodies

3) Website Management System
Integrated Website Management includes the following

- E-governance Examination
- E-Governance of admission and student detail
- Faculty profile
- Intake capacity of each department/college/campus
- Semester wise subject in each degree
- Auto submission of evaluation bills for evaluator
- Budget/Finance/audit System

- E-Report generation
- E-Library and documentation
- E-learning
- Affiliation Function
- Establishment of information centre at each university affiliations college
- Security purpose use of Biometric

The Stakeholders and the users can find out the related information. The University coordinating and Regulating Bodies find the reports on different issues about the future development like finance, course demand, admission etc.
The Regulatory and the accreditation bodies regarding the website management should provide the following information

- Various method like mathematical and statically methods for the plan of development and accurate details about the Indian University
- Details about UGC fund allocation affiliation of courses and recognition of UGC will be provided to regulating authorities.
- The allocated fund details should be monitored on the basis of each college usage of funds and analysed even on monthly basis.

An Online grudge damage system can be made in case of some grudge with the college/University.

III.   ARCHITECTURE OF BIG DATA USING HADOOP FRAMEWORK FOR IMPLEMENTING INDIAN UNIVERSITY

This architectural design provides a basic structure that will contribute to data and tools which gives entry for the researchers in the area of e-governance in Indian universities research.
This basic implementation leads to improvement in structured and unstructured data to integrate data from different sources [6]. The organization and companies are analyzing the big data, exploring and visualizing the big data than ever before because of the emerging data sources[3]. The data that work on advanced analytics have influence with elaborated source data from the original using the technologies such adhoc, SQL, Natural language, mining and predictive algorithms. Thus big data on standalone architecture does not combine with data warehouse environment. It has the basic structure such as Hadoop, NoSQL databases and Data warehouse appliances. The data are analyzed to get clear and deep perspective of data investment in the use ofbig data in Indian university.

Here the emerging data model used for the implementation of utilizing open source data. This systematic approach improves in e-governance in Indian university in combining all the university is difficult to analyze since it contains large data sets which are both structured and unstructured data, difficult connections and a large number of variables which is difficult, should possess through the implementation of big data using Hadoop framework. The use of built-in complex analytics module which is used to operate speedily, by using lightweight independent client side interface there is higher features of availability, scalability and flexibility with cloud provisions. Not to endure the analysis of Indian University the data needs a lot of different technology but also need of Hadoop based system in addition to mass volume of multi-structured data sets for better technology.Figure6.Shows the analytics strategy for big data in Indian university that using multi-structured data sets, for analyzing, serving and detailed features. The orange area shows data analysis for Hadoop based Big Data for the comparative structured and unstructured data.
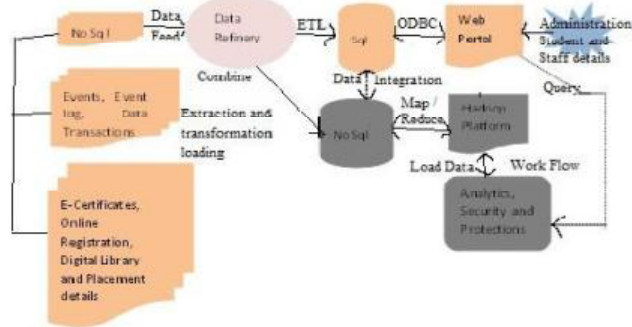

Figure 6. Basic structure to support Hadoop framework in Indian University

IV. BIG DATA ANALYTICS IN INDIAN UNIVERSITY

Data analytics has depicted the attention towards the Indian universities. The absolute expectation of analytics is that ground breaking knowledge can be benefitted from detailed analysis of the data that afford case by case in their mutual action with others, information, technology, and organizations [2]. The speed development of "big data" in their tools and logical arrangements go with the Modern administration, Process and their technology in larger companies [1]. The word "business intelligence" can be expressed by the intersection of data and insight data analytics. In other word, this data analytics in Indian university fall into categories like State, Central, Deemed and Autonomous University analysis which can be categorized in Computerization in University level, Universityonline management and website management of university.
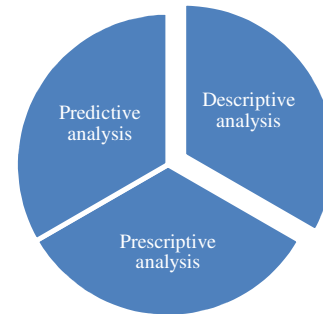

Figure 7. Big data Analytical Model in Indian University

A. Descriptive Analysis

Descriptive Analysis objective is to describe and examine the historical data from the students, staffs, researchers, regulations and the other academic and administrative process. The main aim is to identify the design to reports on the current scenarios like the admission no., graduation percentages and the degree of qualifications.

It also provides the university with an opportunity to deal and collaboration with the learning, teaching and research administration to identify the visible trends and the design to generate the importance of current future and trends. With the descriptive analysis the universities can investigate the frequency of data usage like logins, page views, course completions, colleges under which universities, affiliated colleges etc.

B. Predictive Analysis

It Provide university in a better situation and actionable insight created by the data. It predicts the future events by looking into their new models and designs then identifies the issues related to them and finds out the opportunities and risk among them in future. It helps to find out hidden relationship in data that might not exist in descriptive analysis like completion rate and graphical view.
The risk behavior of the students like failing a semester and dropping out can be easily find out, the course completion rate with the help of tools content in the course are directly correlated to student success.

C. Prescriptive analysis

Prescriptive analysis helps university to access their current situation and alternative course of event based on valid prediction. It combines both the predictive analysis and the descriptive analysis and determines new way to find out new constrains to come out.
In summary, Big Data Analytics provides Indian university to value the existing data and collect missing data which helps to

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make better decisions, with various outcomes (see Figure 8). In particular, Big Data helps institutions with the following performance and process outcomes [4]:
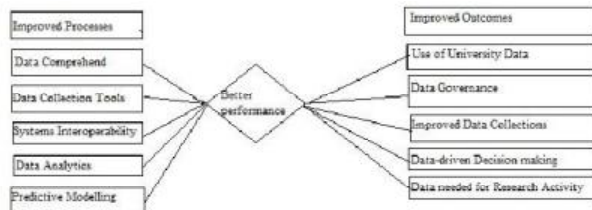

Figure 8.   Big Data analytics outcomes

1)   Performance outcomes
- Effective Action for data analytics for deeper knowledge, accuracy and for decision making
- Comprehending of university data
- Better understanding of the requirements for effective data preparation for Big Data analytics.
- Improved data process for analysing and processing.
- Better data-driven decision making and practice
- Data needed for research activity
- A foundation for the utilisation of Big Data

2)   Process outcomes
- The tools and techniques needed to build the Big in Indian university.
- Improve data analytics and predictive modelling.
- Better real-time outcomes of analytics on students and staff performances.
- Performance analysis and metrics within departments and divisions.
- Usage of historical data and scenarios.
- Better ability to develop and utilise what if' scenarios for exploring data to predict possible outcomes.

V.   E-REPORT GENERATION FOR SIMPLE PROCESS REQUEST SCENARIO BASED ON BIG DATA ANALYSIS

The various process had made under the development of Indian university such as to measure, collect, operate, store and to generate a report. The report is generated based on the request and based on the request the data is selected from the data file and it is filtered based on big data analytical tool and the e-report is generated. The analytical tool which is used to control the member such as student, staff, administrator and the public the result should be filtered on big data analytical tool and the e-report is generated.
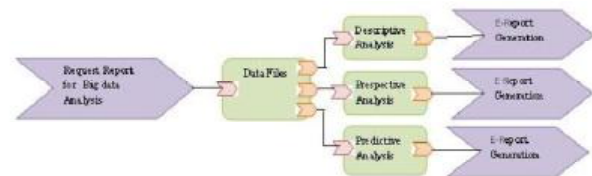

Figure 9. E-Report generation for simple process Request Scenario based on big data Analysis

VI.   CONCLUSION

With the help of E-governance in Indian Universities, all the details are centralized such as centralized database for students, staffs and the finance details. But the data are growing it is scattered all around in a different format and it is difficult to retrieve the information and consolidate. All these are done by analyzing the data using big data and implementation is done through the big data using Hadoop framework and some analytical method for report generation. E-governance in Indian University empowers the development of e-governance in whole country. The most dominating problem is the lack of faculty member and updating the website in an irregular manner. An improvement has to be done by improving the faculty members' skills as well as the administration to improve the quality of the website. Data management and governance structure of are implemented through the big data and its analysis. Success of the E-Governance in the Indian University is not only governed by technology but also by the importance & satisfactoriness by the society & stakeholders in particular. The tools and the integrated technology for developing the framework with regard to Big Data conceptual model are analyzed. Indian University image in the society has ascended high and these proposals taken have played a vital role in Indian University by achieving NAAC grade in higher level accreditation.

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