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## BUSINESS INFORMATICS: WITH SPECIAL REFERENCE TO BIG DATA AS AN EMERGING AREA: A BASIC REVIEW

P. K. Paul<sup>1</sup>, P. S. Aithal<sup>2</sup>, A. Bhumali<sup>3</sup>

<sup>1</sup>Raiganj University (RGU), West Bengal, India

<sup>2</sup>Vice Chancellor, Srinivas University, Karnataka, India

<sup>3</sup>Vice Chancellor, Raiganj University (RGU), West Bengal, India

Corresponding Author: P.K. Paul & email: [pkpaul.infotech@gmail.com](mailto:pkpaul.infotech@gmail.com)

### Abstract

Business Informatics is about the applications and integration of Information Science and Technology into Business and Management tools and techniques into the Business Systems. It is also about combining the concept of Business and Technologies. The field is also called as Business Information Science and in some countries as Business Information Systems. The areas in current age are not only the tools and techniques but also a subject. Initially, the subject treated as a concept and research areas and now this becomes a full-fledged subject in various context. The area of Business Informatics is also increasing in recent past from technologies and tools to conceptual management areas viz. IT Governance, IT Policy, IT Management, Information Administration, and Information Management. In recent past, the concept of technologies have been increased and several areas are included which are majorly part of components of Information Technologies viz. Database Technology, Networking Technology, Communication Technology etc. Among the latest areas Data Sciences play a lead role with the components of Big Data Technologies powered by Data warehousing, Data Mining etc. This paper may be treated as a valuable source for the newcomers in the field of IT and Computing having less conceptual knowledge in the area of Business Informatics and new to the concepts of Big Data. The paper may be a good alternative to know about the basics, characteristics, nature of Big Data with fundamentals of applications.

### Keywords

Business, Management, Business Informatics, Big Data, Data Analytics, Data Sciences, Emerging IT, Business Information Science, India

### Introduction

The world is changing rapidly and behind this change Computing and Information Technology plays a leading role. Similarly, Management also plays a leading role for the development of any kind of organization, institutions, and individuals [1], [6]. Both the concepts in an organizations and institutions lead the growth of merged concept called Business Informatics. Internationally universities are moving towards introducing new age, skill based, interdisciplinary and clustering subjects and domains and Business Informatics is one of the important ones. Ideally, there are variations in the related and allied domains and fields viz.

- Business Information Technology
- Business Information Systems
- Business Information Science/s

- Business Informatics etc [2], [3], [7].

Among the technologies uses in the Business and Cooperates few important and concerns are include Networking and Communication Technologies, Database Technologies etc. Among these, few latest and emerging areas (which are required for promoting Business Systems and Corporate houses) include Internet of Things (IoT), SEO and Digital Marketing, Big Data and Analytics, Security Informatics and Information Assurance etc. The Big Data and its importance are rising due to several issues [4], [5], [8]. First of all, the increasing number of Data and contents and required data in a right from and fight time to the right place. Hence in the context of Business Informatics *Big Data and Analytics* play a leading role managing the large amount and complex data. The role of data is increasing and thus every organization and institution are providing efforts in decision making and organizational development [4], [8], [9].

### Objective of the Paper

The current paper in interdisciplinary, conceptual mainly having the following aim and objectives (but not limited to the)—

- To know about the basics of Business Informatics/ Information Science and its nature and characteristics in brief.
- To learn about the function and role of the Business Informatics with current and future context.
- To know about the areas of Business Informatics with reference to the technology core, management and policy core.
- To learn about the Big Data and Allied Technologies which are fall under the Business Informatics.
- To dig out the latest and traditional features and characteristics of Big Data and Allied Technologies.
- To learn about the function and role of Big Data and Allied Sciences into different fields and sectors.
- To know about the emerging context of Applications of Big Data in Different areas and sectors and challenges.

### Business Informatics

Business Information Science is an important concept of modern Information Age. It is a combination of business studies, Management Studies and Information Science and Technology. Business Information Science deals with following tools, techniques, and technologies (refer fig: 1).

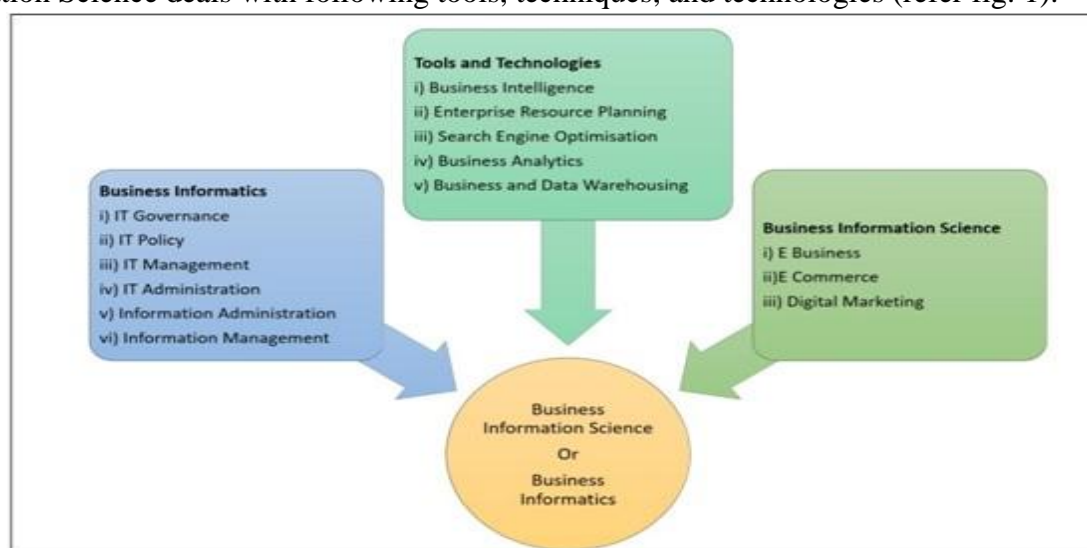


Fig: 1 The typical Areas of Business Information Science

- Business Intelligence
- Enterprise Resource Planning
- Business and Data Warehousing
- Search Engine Optimization
- Business Analytics.

Business Information Science is also called as business informatics (smaller than Business Information Technology) in European countries. Business Information Science is associated with the following as well [5], [8], [10].

- E-Business
- E-Commerce
- Digital Marketing / eMarketing

Business Informatics is also associated with the following areas (in respect of Management)-

- IT Governance
- IT Policy
- IT Management
- Information Administration
- Information Management [4], [7], [11].

### **Business Informatics and Big Data**

Business Informatics is very much close with the concepts of Business Information Technology (*which is smaller than Business Informatics and deals with the attributes and components of IT only*), Business Information Systems (*which is broader than Business IT and deals with the IT Management and System Analysis as a special focus*). As far as Business Information Science is concerned it is about technological and manual information solutions to the business [3], [7], [12]. In generally the following are treated as core components and stakeholders of Business Informatics/IS—

- Content/Information
- Business and Corporate Houses
- Techniques
- Technology (IT & Computing mainly).

The Figure: 2 illustrate different areas required for the purpose of Business Informatics [3], [12], [13]. It is worthy to note that ideally Business Informatics should deals both manual information solutions and technological and here among the manual tools and techniques important are include—

- Indexing Systems
- Abstracting Systems
- Documentation Systems
- Authority File
- Schematic Planning and Charts etc

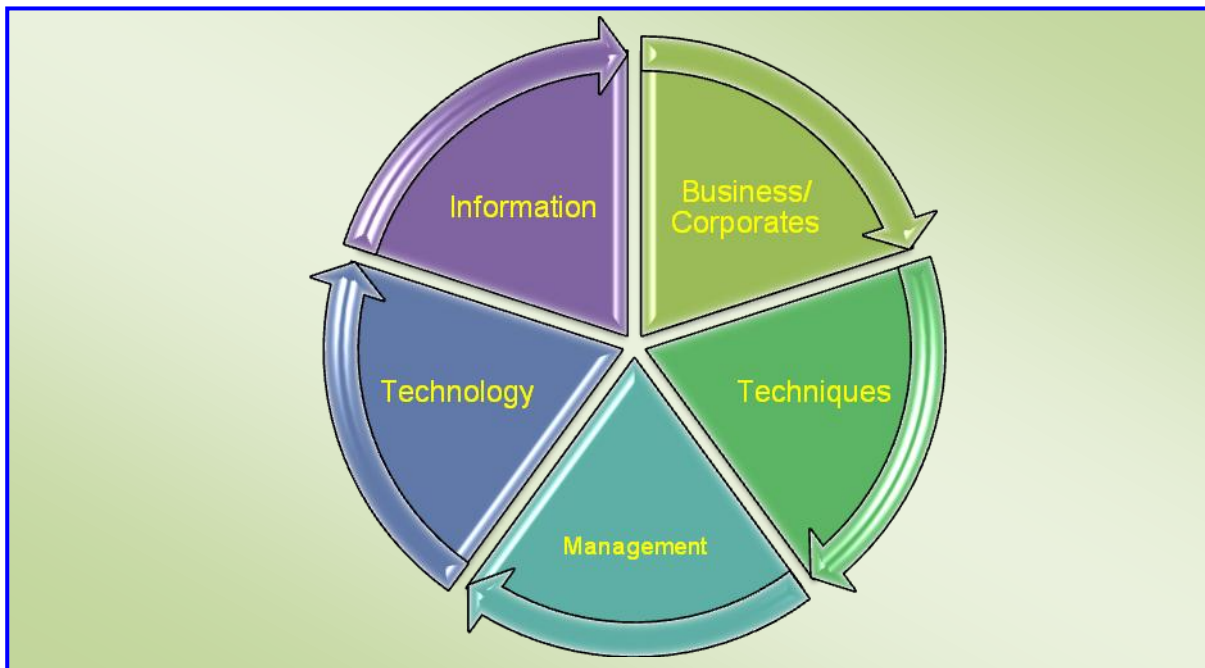


Fig: 2 The stakeholders of Business Information Science

### Big Data and Basics: An Overview

Data play an important role in our life each and everywhere data is useful and applicable such as Health Care, Government, Private, Agriculture, Horticulture, Administration, Education. Day by day role of data and allied facet (information) is increasing. To see such amount of data various technique and method are using for Data Management. Here the concept of Big Data evolved the concept of Managing Complex data and large amount of data is also called Big Data Management. However, due to use of various analytical tools, it is also called as Data Analytics or Simply Analytics.

### Big Data and Foundation

Bigdata and its concept is changing rapidly. The term was coined in 1990 but it has gained its popularity in last few years after the massive growth of data publication and generation. Initially, due to the commercialization of data and its uses in organization and institute, the Bigdata concept has raised.

In 1990 the concept emerged through in 1984 by the 'Tera Data Corporation' the concept taken a new shape (parallel processing DBC 1012). After that 'Teradata' used several structured and unstructured data for proper data management.

In 2000 the organization called seisent IMC did a good job for data collection and management. In recent past, after 2000 many initiatives has been taken by Google, apache e.tc with a different kind of platform.

In recent past, map reduce techniques (by Google) and Hadoop (by Apache) play a vital role in the arena of Bigdata management. Since then many organization and institution are using Big data techniques such as Oracle, IBM, EMC, DELL etc.

### Big Data and Function

Big Data is an important challenge of Information Society and Knowledge society. Big Data become an important issue for managing data. It is primarily responsible for the following purposes—

- Mining Data within a time frame from the Database and Data Warehouse
- Availability of required and useful data is the key concept for big data management.
- Reducing the complexity of data, pin-pointed data is a good way or introducing big data management tools and technique.
- Use data for all and make use of data and allied facet is a vital requirement of big data.

Due to its need in every sector, it's become a vital tool for each and every organization. Hence the requirement of big data and based on its nature, nowadays also called as Business Analytics

(Application of Big Data in Business and Corporate Sector). Application of Big Data in the healthcare segment, hospital it is also known as Health Big Data.

### **Big Data & Characteristics**

Big Data is gaining its popularity due to its overload. The term Big Data is rising not only in the business sector but also in other areas. As per as size is concerned, it is increasing day by day. For example the data of 2012 have increased from few dozen terabytes to many Exabytes. Big Data normally shows following characteristics—

- Big Data needs a better integration of data in respect of diverse, complex and massive scale.
- Big Data deals with database management and foundation of data sciences, software technologies (such as Python or R programming language), a strong foundation in mathematical science and intelligence system such as artificial intelligence, expert system, machine learning, deep learning.
- Big Data is surrounded by parallel computing for a large number of data.
- The business application of IT (that is business intelligence is also an important part of Big Data).
- Big Data lies on discrete mathematics, fuzzy logic, and descriptive mathematics.
- Big Data uses an inductive statistic for low information density.
- Hence, here operation research plays a vital role.

### **Rising Applications of Big Data**

The Applications of Big Data is changing the world and there are many areas in which Big Data applications are rising. Among the areas important are Transportation, Governance, Education, Healthcare, Commerce and Business, Manufacturing etc. Many companies and organizations are doing a lot in Big Data Space such as Microsoft Corporation, Teradata Corporation, SAP, EMC, HP, Dell etc [6], [7].

Government bodies and agencies these days doing lot of task for the implementation of Big Data associated systems and services. Similarly, other areas such as Transportation and similar systems are using advance analytics tools and this trend is continuing. In Education systems including online and digital systems, e-learning etc Big Data systems have played a lead role.

### **Issues and Challenges: *The Power of 'V' and Big Data***

The applications of Big Data are rising in different places and segments due to its importance and need. Though it is most valuable and significant due to its nature and characteristics (described as follows)—

**Volume:** Volume means the amount of data and similar content and form.

**Variety:** In Big data variety kind of data such as normal text, image, audio, video content and Big data is for managing large number of data and complex data. So here technically variety and data fusion is important.

**Variable:** In data management, the variable is an important quantity as data is changeable. Different kind of inconsistency (or uniformity) has to be handled in Big data and data analytics.

**Veracity (quality):** In Big data, veracity is important which means the quality of data is perfect or required means accuracy.

**Velocity:** Velocity is another important feature for Big data management and data analytics. Here speed of the data is an important feature. Big Data always works at real time so this should be an important criterion. Characteristics of Big Data or data analytics performed by the above important features (shown in the Fig: 3).

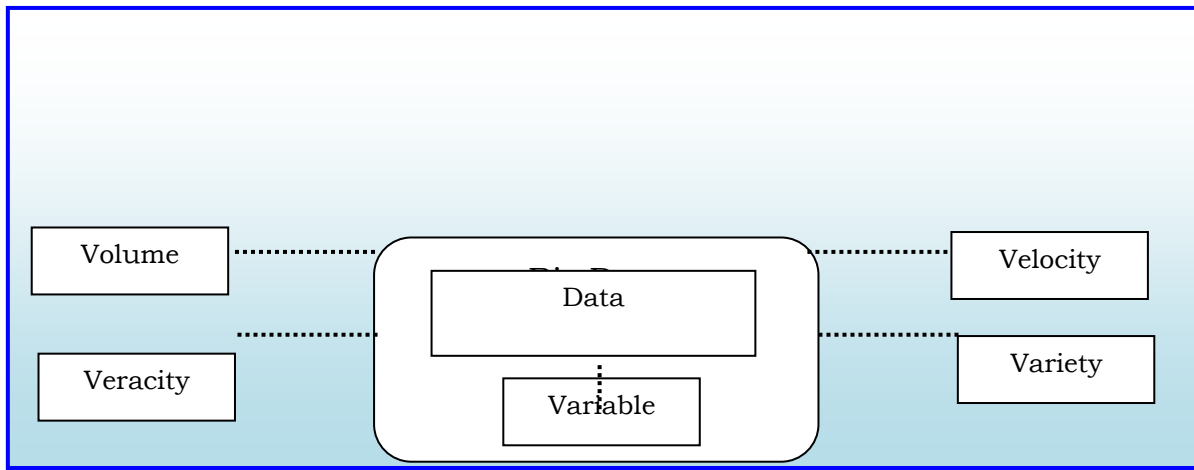


Fig. 3 The Core Characteristics of Big Data

### Conclusion

Big Data is surrounded by various characteristics in terms of volume (it means the data generated, stored and used for a specific operation). Big Data is called about variety (here variety means types of data such as text, image, audio, video etc). Big Data is responsible for data irrespective of size. Hence all the data related affairs, such as capturing, managing, and processing of structured and unstructured data. Big Data is doing a lot with data massive scaling and many data scientist have claimed and expressed that it has linked and dependencies with various cyber physical systems (CPS) such as Correction with sensor and network, Cloud (of different form), Cyber, Content, Community, Customization. The Business organizations in today's world are purely based on the advancement information and technologies. Hence Information and Technologies all need to be proper and available and in this context, Big Data may help in promoting Organizational Informatics or Business Informatics practice.

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