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How Big Data is Anchoring Biotechnological and Medical Industries to Solve Newer Obstacles?

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Today each second, approximately 200 million+ files are generated (through emails, Snapchat, Facebook, YouTube, search engines). This is a lot of data. Instead of junking it, this can be utilized in a lot more innovative ways to solve contemporary problems. This data is generated by a lot of people in a lot of sectors. Big Data will not only save our time but also increase the accuracy of the data results since chances of human error are less. So, let's look at how this data causes innovations in pharma and biotechnological industries.

ARTICLE HISTORY

Paper Nomenclature:

Case Based Study (CBS)

Paper Code: CYBNMV2N4APR2020CBS1

Submission Online: 01-Apr-2020

Manuscript Acknowledged: 04-Apr-2020

Originality Check: 05-Apr-2020

Originality Test Ratio: 8% (Turnitin)

Peer Reviewers Comment: 11-Apr-2020

Blind Reviewers Remarks: 12-Apr-2020

Author Revert: 13-Apr-2020

Camera-Ready-Copy: 20-Apr-2020

Editorial Board Citation: 21-Apr-2020

Published Online First: 25-Apr-2020

Keywords

- Technology
- Data Integration
- Big Data
- Generation
- Services
- Biotechnological

Introduction

Big Data is a giant path waver for new generation data analysis and production. This takes product consumption and generation to greater heights. There are so many people utilizing several services and products throughout the world; in turn, generating a large number of data each day. This data consists of very useful information- e.g.: An-18-year old girl in America buys an iPhone and starts using it. She uses various applications, browses through different web pages, views many videos, and listens to songs throughout the day. This itself generates a lot of data which can be used for various analyses like; what

kind of applications are mostly utilized by teenagers? Which kind of songs do they love to listen most? What web pages and content is the teen youth searching for? And a lot more. This can be utilized by the producers in the industry to generate 'similar' kinds of stuff or we can say- consumer oriented products. This increases the chances of success of a product in the market by many folds. The consumer is also benefited as they are more likely to find the product they are looking for.

Let us look at an example from the healthcare industry, hospitals and clinics generate a massive **VOLUME** of data- approximately 2314 Exabytes of data annually throughout the world. This data is generated by a

large **VELOCITY**, meaning a huge amount of data is collected very fast in a lesser amount of time. These are generally test records and patient records. These are maintained in excel sheets, log files, or X-ray images, leading to a **VARIETY** of structured, semi-structured, and unstructured data. This data has to be accurate and trustworthy for this technique to actually work i.e. **VARACITY** of data is highly crucial. So, in the end analyzing this data will be of **VALUE** to the industry like reduced costs, better disease detection, and treatment. *These 5 V's determine to us that this is Big Data.*

Biotechnology is a field where we study living organisms in order to develop

products. A field that involves biology at such a complex level, the data being generated is huge; and is surely going to increase exponentially in the future. Biotech underbears 5 main branches- Animal biotechnology, medical biotechnology, and environmental biotechnology, medical and industrial biotechnology. Data for genomes and classification of various vertebrates and invertebrates, plants, records of each organism with their properties; human genes and diseases; RNA sequences; proteomics, cell biology, organelles, etc. will continue to grow in future. With such a large data set comes the task of managing and storing this data as well. Also, reading, understanding, and analyzing such a huge pool of information can be tedious.

Data integration is an initial and very crucial step to data analysis. This involves gathering information from various authentic sources, fetching for the desirable data sets, cleaning, trimming, etc. and this is repeated for

all the sources that are approached in the process. Each scientist analyzes this data, makes their own results, and inputs their own knowledge leading to a unique analysis report. Big data provides a neutral, unbiased analysis that can serve an initiation to several chains of thoughts. It can gather statistics for the problems that most of the people are facing today, which can guide scientists to prioritize their researches and experts. Biotechnology is not only about inventing; but also about developing them into usable practical products and launches them into markets. So catering to the present needs of people can also be taken care of.

Genomics is a branch that deals with a lot of data- for sequences, base pairs, etc. It can largely benefit from big data. Big data databases can decode the whole genome for mere thousands of dollars, for what billions were required years ago in the Human Genome Project. There are lakhs and thousands of chemical compounds that

are present, from which appropriate ones can be chosen through big data for pre-clinical trials. So, big data helps in Pharma automation which helps faster research to market cycles by saving money and reducing risks. Big Data similarly puts forth the analysis of various other subjects, giving out useful knowledge, trends, and needs of the time. Cereal losses are becoming common with increasing times. GPS tractors can send data to the big data framework, which can help the agriculture sector from changing environmental conditions. There are several other uses of big data in this field which cannot be listed in an article or two. Hence, this technology is being used for the benefit of all.

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Arushi Verma - a student, currently pursuing B.tech in Biotechnology (Amity University). I believe that cybernetics and the internet is like a ball of strings which acts like a mediator, and connects several disciplines of our society. As a result, we can all relate to each other better and help different people through our own knowledge.

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Annexure I

Submission Date	Submission Id	Word Count	Character Count
05-Apr-2020	1378908911	925	4998

ORIGINALITY REPORT

1	1	0	0
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Reviewers Comment

Reviewer's Comment 1: The article is well written and also explained very well, and the key points are well taken.

Reviewer's Comment 2: The article is good but big data predictive analytics could be explained and defined well, because the predictive model of big data is the most used model in health organizations. All other key points are taken very well and have good knowledge of Big data.

Reviewer's Comment 3: The article briefly describes Big data technology and its impact on pharma industry and give leads for further research.



Editorial Excerpt

The article has 08% of plagiarism which is accepted percentage for publication the finding related to this manuscript related to Big data vis-a-vis biotechnological industry. The relevance of Big Data analytics in biotechnological industry has immense prospective for improving the quality of care, reducing waste and error, and reducing the cost of care. It has been earmarked finalized for publication under the category of "Case Base Study (CBS)".

Acknowledgement

Author is highly indebted to Scholastic Seed Inc. a publisher of Cybernomics Magazine & entire editorial team including Resident Associate Editors (Ms. Sonakshi, Ms. Jyoti & Ms. Shailza) who have facilitated at each juncture during and after the publications of articles in a camera ready shape in a particular volume and issue of a magazine and nonetheless also grateful to reviewers for their valuable comments.

Disclaimer

All Views expressed in this paper are my own, which some of the content are taken from open source websites for the knowledge purpose. Those some of I have mentioned above in references section.



Citation

Arushi Verma
"How Big Data is Anchoring
Biotechnological and Medical
Industries to Solve Newer Obstacles?"
Volume-2, Issue-4, April 2020.
(www.cybernomics.in)

Frequency: Monthly, Published: 2020
Conflict of Interest: Author of a Paper
had no conflict neither financially
nor academically.