



SIGNIFICANCE OF BIG DATA ANALYTICS FOR ORGANIZATIONAL EFFECTIVENESS

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Abstract

Effective risk management techniques can be developed using big data analytics to find new dangers in data trends. Businesses may make quicker and better decisions with the help of the insights business users derive from pertinent data. Businesses can gain timely insights on sales, marketing, finances, product development, and other topics with the aid of data analytics. It enables teams within organisations to work together and get better results. Businesses can improve future business operations by analysing historical business performance. The researchers have collected the data from 200 employees working in information technology sector using survey method with the help of well-structured questionnaire. The researcher identified that descriptive research design and Non probability convenience sampling method is suitable for the research study. The findings of this study will be useful to many companies to sustain in the competitive world.

Keywords: Big data analytics, organizational effectiveness, Analytic methods, Analytic tools etc.

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1. Introduction

The phrase "Big Data" has recently been used to describe datasets that grow to sizes that make it challenging to handle them with traditional database management systems. They are data sets that are too big to be recorded, saved, managed, and analysed in a timely manner with the aid of commonly used software tools and storage platforms. Due to the continual increase in big data volumes, a single big data collection can currently hold anywhere from a few dozen terabytes (TB) to many petabytes (PB) of data. Massive data might be difficult to obtain, store, search, share, analyse, and show as a result. Businesses are currently studying enormous amounts of extremely detailed data in attempt to discover anything new.

Approaches to Big Data

1. Performance Management
2. Data investigation
3. Sociological Analysis
4. Decision-Making

Challenges to Big Data Analytics

1. Knowledge Gap Professionals
2. Lack of adequate comprehension of Massive Data
3. Data Growth issues
4. Confusion while Big Data Tool selection

Literature Review

Big Data's unique qualities, such as their velocity and variety, present a number of difficulties when choosing features. Big Data is inherently complex and noisy since it comes from a variety of sources. Due to the heterogeneity, accuracy, and incompleteness of the data, feature selection must be done differently (Rong et al., 2019). These qualities also give us a variety of options for choosing features and assessing the current feature selection methodologies (Li & Liu, 2017).

Appropriate data processing and management could reveal fresh information and make it easier to quickly respond to new possibilities and problems (Chen et al., 2013). However, it appears that the expansion of data in the digital world is outpacing the development of the various computing infrastructures already in place. Given the volume of data the world is currently producing, established data processing technologies, such as databases and data warehouses, are becoming insufficient. Iterative and time-sensitive analysis of the vast amount of data is required (Juki, Sharma, Nestorov, & Juki, 2015).

Big data analytics are "the widespread use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive choices and actions," according to Davenport and Harris (2007). In other words, the raw material in this case is data, which is processed

using a variety of statistical methods. What is happening at the organisational level is the implementation of a new management style that is based on evidence, as opposed to making decisions based solely on intuition or prior experience, or so-called "gut feelings." Big data refers to high volume, high speed, and/or high diversity information assets that call for creative, cost-effective methods of information processing to improve insight, decision making, and process automation (Gartner, n.d.)

In light of the big data analytics phenomenon, numerous company reports appear to point to the same fundamental problem, with the majority of the difficulties businesses experience in generating commercial value being of an organisational character (Kiron, 2017). There is still little knowledge of what organisational factors are crucial when seeking to derive economic value from investments in big data analytics, despite the fact that this issue is becoming more and more evident in academic literature and practise (Abbasi et al., 2016; Mikalef, Framnes, et al., 2017). Furthermore, little is known about how the context affects these skills and forms the elements essential to achieving performance improvements (Günther, Mehrizi, Huysman, & Feldberg, 2017).

2. Research Methodology

Objectives of the study

- To study the concept of big data analytics.
- To study the big data analytics tools and methods.
- To study the impact of big data analytics on organizational effectiveness.

Hypothesis of the Study

H1: There is a significant impact of big data analytics on decision making activities of an organization.

H2: There is a significant impact of big data analytics on cost reduction of an organization.

H3: There is a significant impact of big data analytics on sales growth of an organization.

H4: There is a significant impact of big data analytics on market share of an organization.

H5: There is a significant impact of big data analytics on profitability of an organization.

Scope of the study

- The study is conducted across Pune City.
- The study is related to only information technology sector.

Following methodology was designed for the study to collect primary data.

- a. Identify a sample of 200 employees working in information technology sector from Pune City, using convenience sampling.
- b. Design and validate questionnaire

- c. Seek responses on a 5-point frequency scale.
- d. Conduct the survey
- e. Summarize the responses
- f. Analyze the results

Scheme formed for testing of hypotheses

- a. Responses were collected under 2 sections
- b. For each of the sections an average was calculated.
- c. Percentages to questions under a particular section of the questionnaire were averaged to get a single score for that section,

- d. P-values were calculated, and the null hypotheses was checked for rejection or non-rejection.

Reliability and Validity

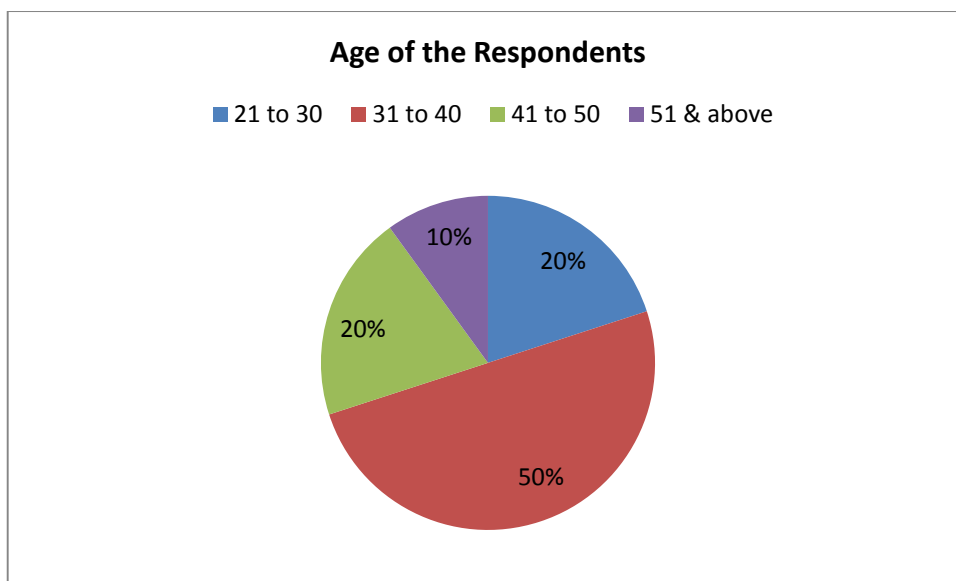
The researcher has carried out reliability test using SPSS. The Cronbach's Alpha identified is 0.840, and it is more than 0.700, that's why the Questionnaire is measured to be reliable. The researcher has used face validity and content validity and confirmed that this research tool is valid for the study.

Research design

Type of Research Design	Descriptive Research Design
Sampling Technique	Non-Probability Convenience Sampling
Sampling Area	Pune City
Sample Size	200 employees
Primary Data	Well-structured questionnaire
Secondary Data	Research papers, Articles, Books, Journals etc.
Data Analysis tools	IBM SPSS-20 and Ms Excel-2010

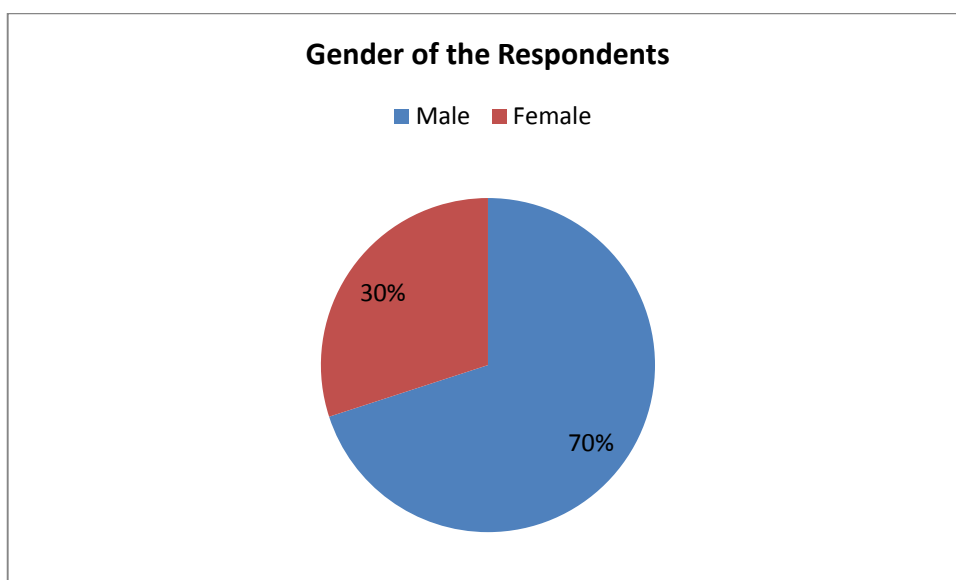
Data Analysis**Age of the Respondents**

Age	Frequency	Percentage
21 to 30	40	20
31 to 40	100	50
41 to 50	40	20
51 & above	20	10
Total	200	100



Gender of the Respondents

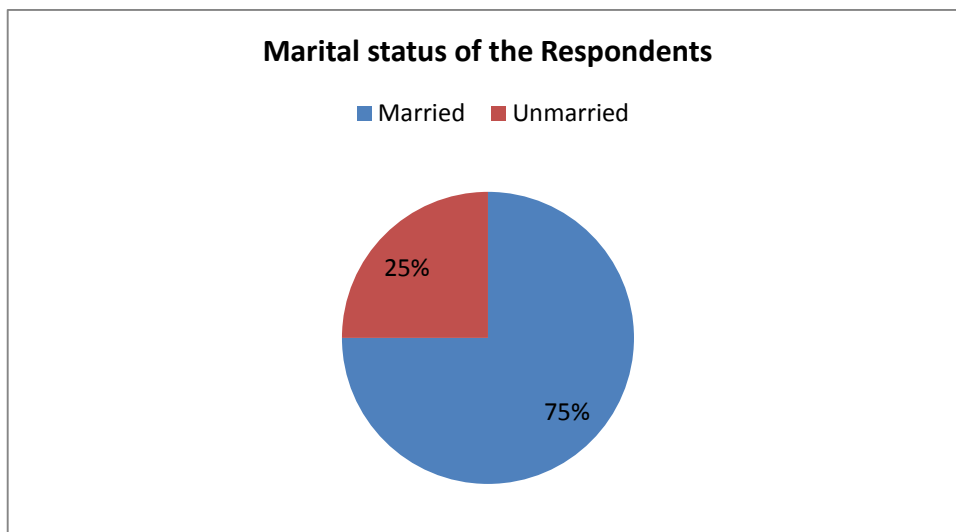
Gender	Frequency	Percentage
Male	140	70
Female	60	30
Total	200	100



Marital status of the Respondents

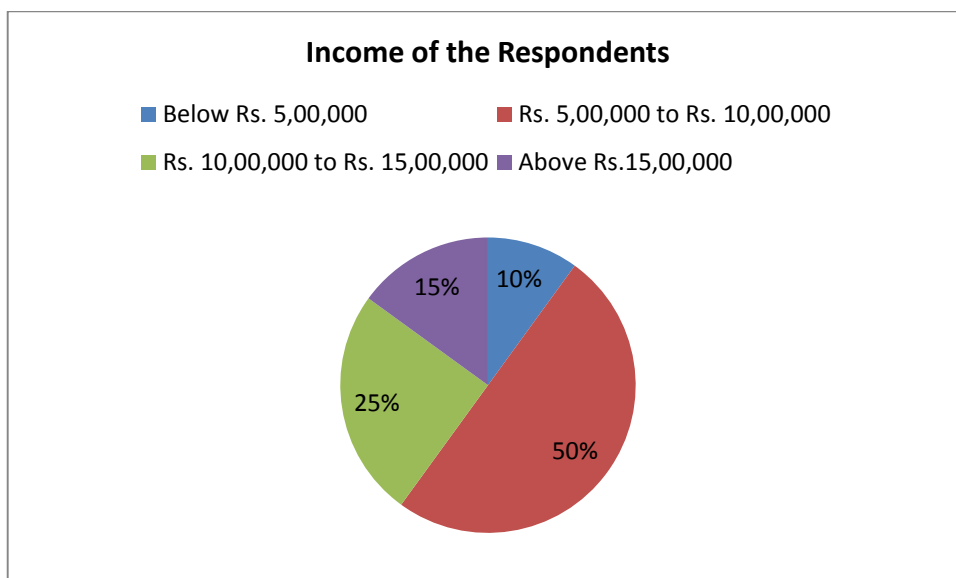
Marital Status	Frequency	Percentage
Married	150	75

Unmarried	50	25
Total	200	100



Income level of the Respondents

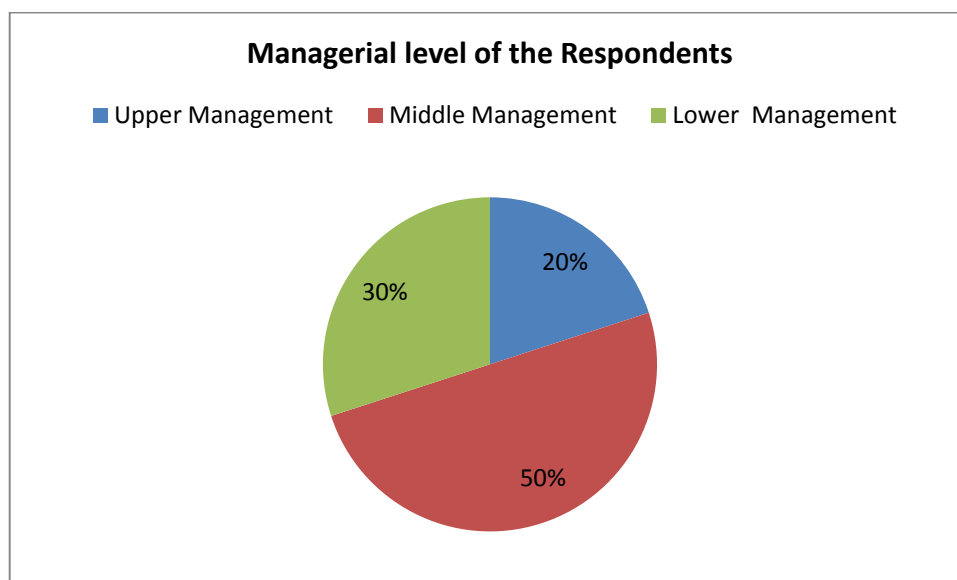
INCOME	Frequency	Percentage
Below Rs. 5,00,000	20	10
Rs. 5,00,000 to Rs. 10,00,000	100	50
Rs. 10,00,000 to Rs. 15,00,000	50	25
Above Rs.15,00,000	30	15
Total	200	100



Managerial level of the Respondents

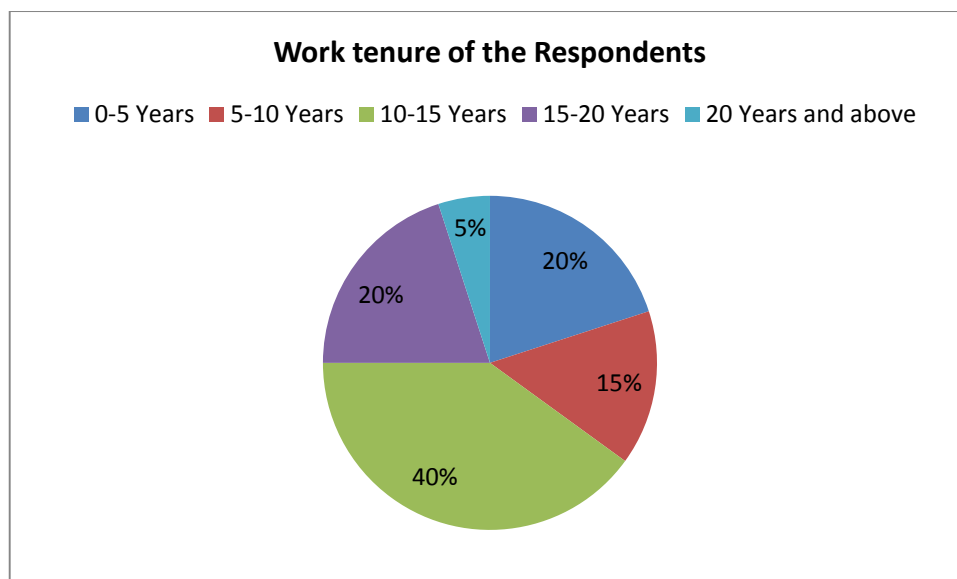
Managerial Level	Frequency	Percentage
Upper Management	40	20

Middle Management	100	50
Lower Management	60	30
Total	200	100



Work tenure of the Respondents

Work Tenure	Frequency	Percentage
0-5 Years	40	20
5-10 Years	30	15
10-15 Years	80	40
15-20 Years	40	20
20 Years and above	10	5
Total	200	100

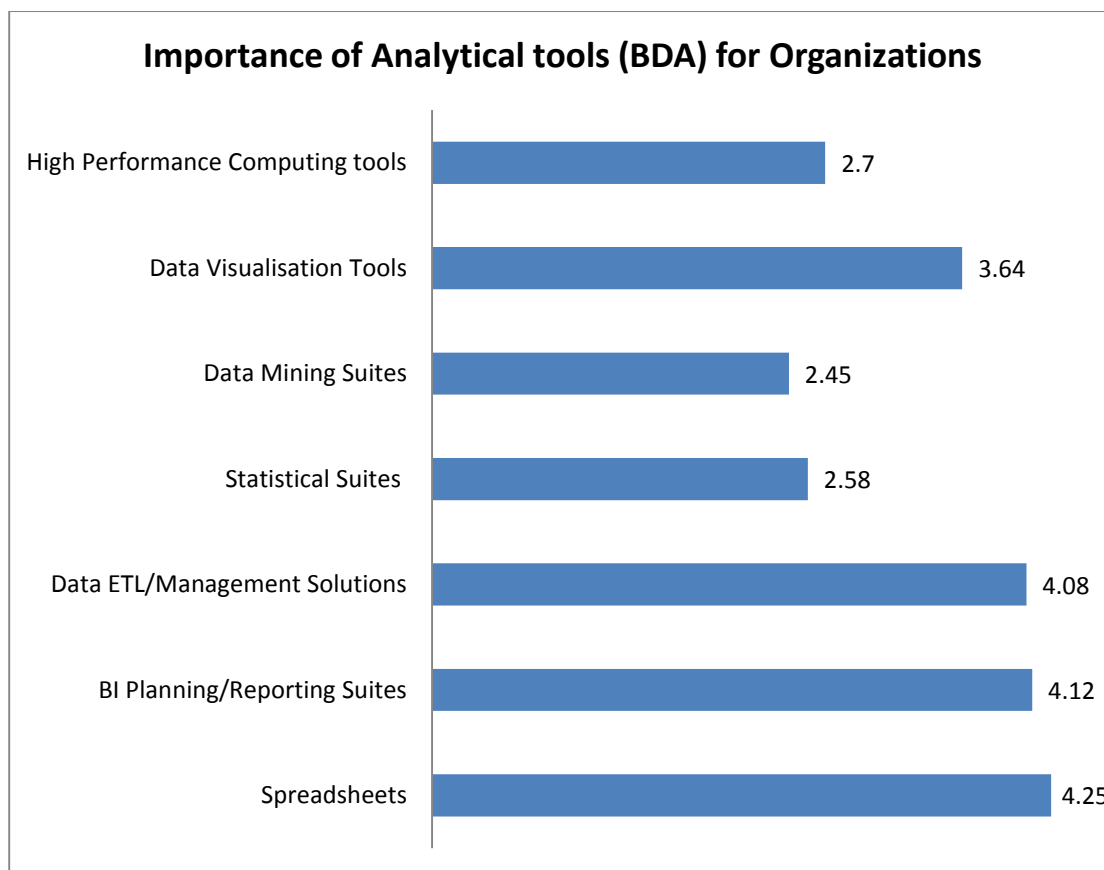


Measurement tool - 5 Point rating scale

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Rating	1	2	3	4	5

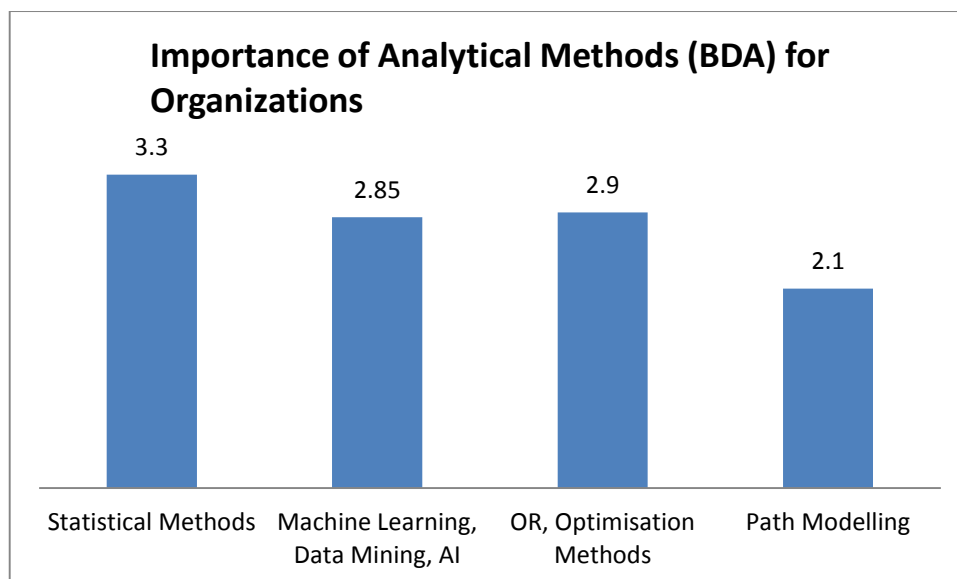
Importance of Analytic tools (BDA) for Organizations

Analytic Tools (BDA)	Mean
Spreadsheets	4.25
BI Planning/Reporting Suites	4.12
Data ETL/Management Solutions	4.08
Statistical Suites	2.58
Data Mining Suites	2.45
Data Visualization Tools	3.64
High Performance Computing tools	2.70



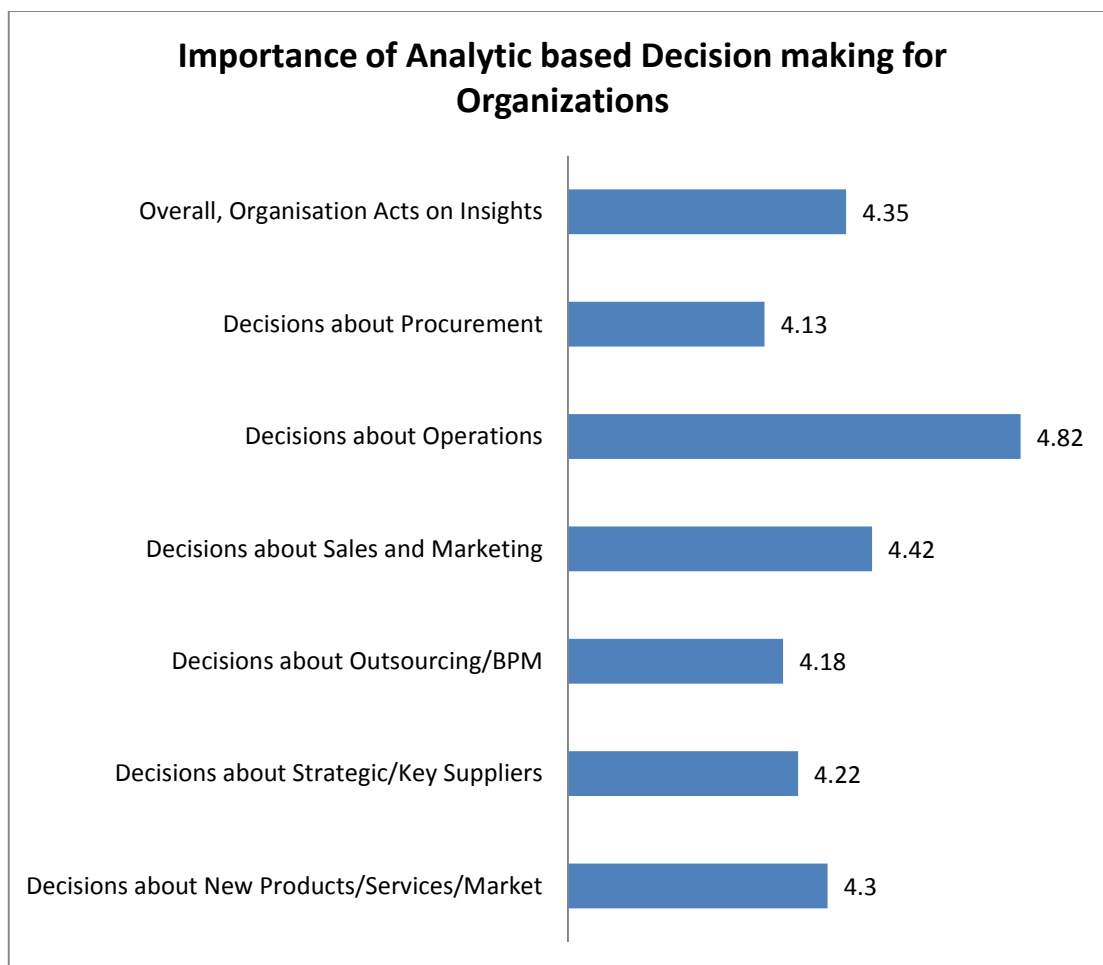
Importance of Analytic methods (BDA) for Organizations

Analytic Methods (BDA)	Mean
Statistical Methods	3.3
Machine Learning, Data Mining, AI	2.85
OR, Optimization Methods	2.9
Path Modeling	2.1



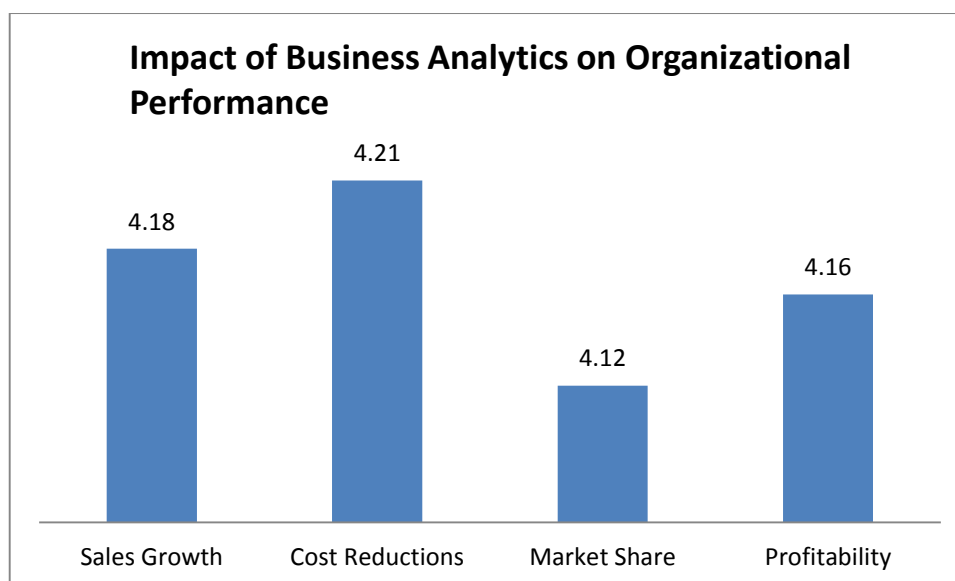
Importance of Analytic based decision making for Organizations

Analytic-Based Decision-Making	Mean
Decisions about New Products/Services/Market	4.3
Decisions about Strategic/Key Suppliers	4.22
Decisions about Outsourcing/BPM	4.18
Decisions about Sales and Marketing	4.42
Decisions about Operations	4.82
Decisions about Procurement	4.13
Overall, Organization Acts on Insights	4.35



Impact of Business Analytics on Organization Performance

Performance	Mean
Sales Growth	5.13
Cost Reductions	4.72
Market Share	4.84
Profitability	4.94



Hypothesis Testing

		BDA in Organization	BDA in Decision making	BDA in Cost reduction	BDA in Sales growth	BDA in Market share	BDA in Profitability
BDA in Organization	Pearson Correlation	1	0.174	0.147	0.135	0.133	0.128
	Sig. (2 tailed)		0.001	0.001	0.002	0.002	0.001

From the above table we can say that all the hypothesis of this study H1, H2, H3, H4 and H5 are accepted as all the test results are significant. Big data analytics is positively correlated in decision making ($r = 0.174$, $p < 0.01$), Big data analytics is positively correlated in cost reduction ($r = 0.147$, $p < 0.01$), Big data analytics is positively correlated to sales growth ($r = 0.135$, $p < 0.01$), Big data analytics is positively correlated to market share ($r = 0.133$, $p < 0.01$), Big data analytics is positively correlated to profitability ($r = 0.128$, $p < 0.01$).

3. Conclusion

From the present research study it is observed that there is a significant impact of big data analytics on organization effectiveness.

Contribution to Industry

This research study will be helpful to information technology sector to design new strategies related to big data analytics and its implementation for organization effectiveness.

Contribution to Academicians

This research study will be helpful to academicians to develop theoretical models related to big data analytics and its tools.

Contribution to Students

This research study will be helpful to students to understand the concepts like big data analytics, various tools and methods of big data analytics, decision making, organization effectiveness, etc

Scope for the further research study

There is also a further scope for the research on the topics like study on various tools and methods of big data analytics, future of big data analytics, effectiveness of big data analytics for various organizations, importance of big data analytics for employees and customers etc.

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