

Exploring Data Analytics for Enhancing Decision-Making: A Study

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Abstract - This study explores how data analytics is being perceived and used for decision-making across various industries. While many modern organizations are shifting toward data-driven strategies, others still rely on traditional methods. The research was motivated by an internship experience at Chennai Port Authority, where conventional decision-making is dominant. The objective was to understand the awareness, usage, and perceived effectiveness of data analytics tools among employees across sectors. Data was collected through a structured online questionnaire, and responses were analysed using SPSS. Key findings indicate a positive perception of data analytics, though many organizations lack proper implementation. The study suggests a growing need for data literacy and infrastructure enhancement to support analytical decision-making, especially in traditional organizations like port authorities. These insights can guide businesses toward integrating analytics for improved operational and strategic outcomes.

Key Words: Data analytics, decision making, employee perception, SPSS, traditional organizations, analytics tools.

1. INTRODUCTION

In today's competitive business environment, effective decision-making is increasingly dependent on the use of data analytics. With the advent of big data, artificial intelligence (AI), and machine learning (ML), businesses can harness massive volumes of information to improve efficiency, reduce costs, and enhance strategic planning. Despite this, a significant number of organizations still follow traditional methods based on experience, intuition, or limited data. This research was inspired by the internship experience at Chennai Port Authority, where it was observed that decisions were largely based on conventional methods rather than advanced analytics.

The primary aim of this study is to explore the perception and adoption of data analytics tools among employees in different sectors. Through this research, we intend to shed light on the awareness levels, usage patterns, and challenges faced by organizations in implementing data analytics for decision-making. The insights derived can help identify the gaps and potential for adopting analytical approaches, especially in traditional sectors like logistics and port operations.

2. Methodology

This study adopted a quantitative research approach using a structured questionnaire as the primary tool for data collection. The questionnaire was designed to assess employees' awareness, usage, and perceptions of data analytics in decision-making within their organizations. Questions were framed to capture key dimensions such as accessibility of data tools, frequency of use, perceived impact on decision quality, and organizational support for analytics.

Data collection was carried out through Google Forms, enabling responses from multiple industries. A total of 100 responses were gathered from professionals working in sectors such as retail, IT services, manufacturing, and finance. The sample was selected based on convenience sampling, targeting respondents with varying levels of experience and roles to capture diverse viewpoints.

The collected data was analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics were used to understand response patterns, and inferential statistics, including chi-square tests and cross-tabulations, were applied to identify associations between variables such as job role, industry type, and perception of analytics effectiveness.

This approach helped ensure that the findings reflect practical insights into how analytics is integrated or underutilized in decision-making processes across sectors.

3. Results and Discussions

3.1 Industry-wise Distribution of Respondents:

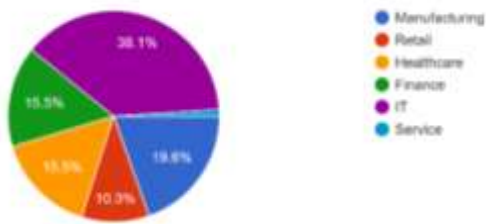


Fig -1: Distribution of respondents from different industries

INTERPRETATION:

The highest participation is from IT Industry

3.2 Adoption of Data Analytics in Respondent's Organization:

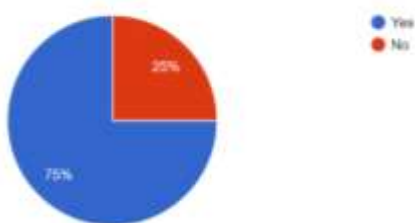


Fig -2: Distribution of adoption of DA in respondent's organization

INTERPRETATION:

The majority of respondent's organization **have** adopted data analytics for decision-making

3.3 Employee Perception on Data Analytics in Decision making process:

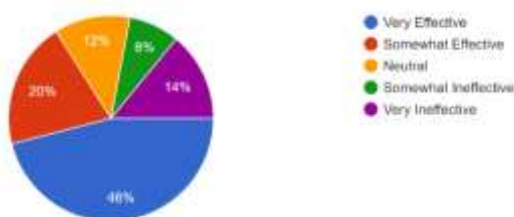


Fig -3: Distribution of employee perception on DA in decision making process

INTERPRETATION:

The majority of respondents perceive data analytics as very effective in improving decision-making.

3.4 Employee Perception on Importance of Data Analytics in Future:

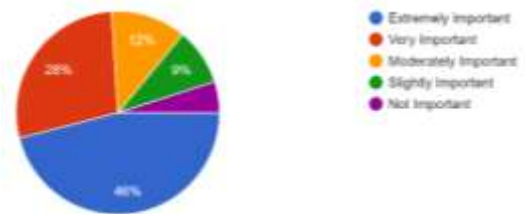


Fig -4: Distribution of employee perception on importance of DA in future

INTERPRETATION:

The majority of respondents consider data analytics to be extremely important for future decision-making.

3.5 Role of Respondents in the Organization:

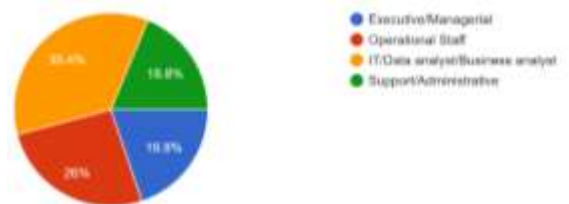


Fig -5: Distribution of role of respondents in the organization

INTERPRETATION:

The highest participation is from Analyst Role, indicating a strong representation from this group.

3.6 Frequency of DA usage in Respondent's Organization:



Fig -6: Distribution of frequency of DA usage in respondent's organization

INTERPRETATION:

The majority of respondents indicate that their organization uses data analytics frequently

3.7 Benefits for Organization from Data Analytics:

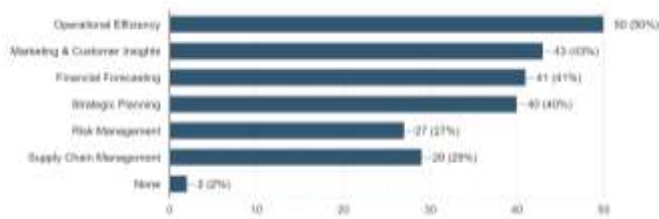


Fig -7: Distribution of Benefits for Organization from Data Analytics

INTERPRETATION:

The survey results indicate that the most commonly recognized benefits of data analytics are Operational Efficiency, Financial forecasting, Marketing and customer Insights.

3.8 Chi Square Test (Use/Adoption of DA & Effectiveness of DA):

Hypothesis:

Null Hypothesis (H_0): Data analytics does not significantly impact decision-making effectiveness.

Alternative Hypothesis (H_1): Data analytics positively influences decision-making effectiveness.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	28.222 ^a	4	<.001
Likelihood Ratio	29.485	4	<.001
N of Valid Cases	100		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 2.00.

Table 1: Chi Square Test (Use/Adoption of DA & Effectiveness of DA)

Result: Since $p < 0.05$, we reject the Null Hypothesis (H_0) and accept H_1 : Data analytics positively influences decision-making effectiveness.

Chi-Square Test Interpretation:

The chi-square test was conducted to examine the relationship between the adoption of data analytics by organizations and the effectiveness of data analytics in decision-making.

- Null Hypothesis (H_0):** Data analytics does not significantly impact decision-making.
- Alternative Hypothesis (H_1):** Data analytics positively influences decision-making effectiveness.

The results showed that $p < 0.05$, indicating a statistically significant relationship between the two variables. Therefore, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1).

Conclusion:

There is a significant association between the adoption of data analytics and its effectiveness in decision-making. This suggests that organizations that adopt data analytics are more likely to experience improvements in their decision-making processes.

3.9 Chi Square Test (Use/Adoption of DA & Industry Type):

Hypothesis:

Null Hypothesis (H_0): There is no significant association between industry type and the use of data analytics

Alternative Hypothesis (H_1): There is a significant association between industry type and the use of data analytics.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.057 ^a	5	.691
Likelihood Ratio	3.386	5	.641
N of Valid Cases	100		

a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is .25.

Table 2: Chi Square Test (Use/Adoption of DA & Industry type)

Result: Since $p = 0.691 > 0.05$, we fail to reject the Null Hypothesis (H_0) and conclude that there is no significant association between industry type and the use of data analytics

Chi-Square Test Interpretation:

The chi-square test was conducted to assess whether there is an association between **industry type** and the **adoption of data analytics** among organizations.

- **Null Hypothesis (H_0):** There is no significant association between industry type and the use of data analytics.
- **Alternative Hypothesis (H_1):** There is a significant association between industry type and the use of data analytics.

The test result showed $p = 0.691$, which is **greater than 0.05**. Therefore, we **fail to reject the null hypothesis (H_0)**.

Conclusion:

There is no significant association between industry type and the adoption of data analytics. This implies that the use of data analytics is relatively consistent across different industries and is not limited to any specific sector.

3.10 Independent Sample Test (Use/Adoption of DA & Training Availability):

Independent Samples Test									
Levene's Test for Equality of Variances					t-Test for Equality of Means				
	F	Sig.	t	df	t Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Adoption of Data Analytics (Training vs. No Training)	.000	.999	0.000	98	.999	.000	.000	-.000	.000
Adoption of Data Analytics (No Training vs. Training)	.000	.999	0.000	98	.999	.000	.000	-.000	.000

Table 3: Independent Sample Test (Use/Adoption of DA & Training Availability)

Result:

- $p < 0.001$ (statistically significant)
- Reject $H_0 \rightarrow$ **Training availability does not significantly impact on data analytics adoption.** And Accept Alternate hypothesis: Training availability significantly impacts data analytics adoption.

INDEPENDENT SAMPLES TEST INTERPRETATION:

An independent samples test was conducted to examine whether training availability has an impact on the adoption of data analytics in organizations.

- **Null Hypothesis (H_0):** Training availability does not impact data analytics adoption.
- **Alternative Hypothesis (H_1):** Training availability significantly impacts data analytics adoption.

The test result showed that $p < 0.001$, indicating a statistically significant difference.

Conclusion: Since the p-value is less than 0.05, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1). This means that training availability has a significant impact on the adoption of data analytics in organizations. Organizations providing training are more likely to successfully adopt and implement data analytics practices.

4. CONCLUSIONS:

This study explored the role of data analytics in enhancing decision-making across various industries. The findings suggest a statistically significant positive impact of data analytics on decision-making effectiveness. Organizations that adopt data analytics tools are more likely to make informed and efficient decisions.

However, the study also revealed that the adoption of data analytics does not vary significantly between industries, indicating a widespread and uniform acceptance of analytics regardless of the sector. Furthermore, training availability was found to be a crucial factor influencing the adoption of data analytics within organizations. This implies that without proper training and upskilling, even organizations aware of the benefits of analytics may struggle to integrate these tools effectively.

Overall, the study highlights the importance of training programs and organizational support in promoting the effective use of data analytics for strategic and operational decision-making.

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