

The role of statistical analysis in organizational decision-making in some selected private institutions in Mogadishu, Somalia

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Abstract

This thesis explores the role of statistical analysis in decision-making within private institutions in Mogadishu. The study aims to address challenges such as limited awareness and understanding, inadequate data-driven decision-making, and implementation barriers. The objectives include identifying statistical analysis techniques used, assessing the impact on decision-making accuracy, examining challenges faced, and identifying benefits and opportunities. The target populations include Hormuud Telecom, Premier Bank, and Mogadishu University, with a total population of 100. A sample size of 80 respondents is determined through purposive and random sampling methods. The research design adopts a quantitative approach, and data is collected through a self-administered questionnaire. The findings highlight the benefits of statistical analysis but also reveal challenges such as limited data availability and skills in decision-making. Addressing these challenges is crucial for effective decision-making. The study recommends increasing data availability, promoting skill development, raising awareness, and allocating sufficient resources. By implementing these recommendations, private institutions can enhance their utilisation of statistical analysis and improve decision outcomes.

Keywords: Statistical Analysis, Organizational Decision Making, Private Institutions, Mogadishu.

1. INTRODUCTION

Statistical analysis is a potent instrument that has been applied extensively in many different domains to glean insights, arrive at wise conclusions, and resolve intricate issues. Finding patterns, connections, and trends in data entails applying statistical approaches to the data. Statistics are being used more and more in academic research and real-world applications in fields including manufacturing, marketing, healthcare, and finance (Smith, 2020).

Organizational decision making is a critical process that determines the direction, strategies, and actions of an organization. Effective decision making is vital for the success and sustainability of both private and public institutions. It involves the identification of problems or opportunities, the evaluation of alternative courses of action, and the selection of the most appropriate option based on available information and resources (Jones, 2021).

Making decisions inside an organization is a complicated, multidimensional process that is impacted by a range of internal and external variables. Organizational structure, culture, leadership philosophies, group and individual dynamics, competitive and market situations, technical developments, and regulatory settings are some of these variables. Making decisions that support corporate goals and objectives requires decision makers to negotiate these factors (Robinson et al., 2019).

Private institutions in Mogadishu, the capital city of Somalia, play a significant role in the socio-economic development of the region. These institutions encompass a wide range of sectors, including education, healthcare, finance, manufacturing, and service industries. Private institutions operate in a complex and dynamic business environment, facing unique challenges and opportunities (Ahmed & Ali, 2023).

The research questions for the study on the role of statistical analysis in organizational decision making within selected private institutions in Mogadishu are as follows:

1. What types of statistical analysis techniques are currently used in decision making within the selected private institutions in Mogadishu?
2. To what extent is data-driven decision making practiced within the selected private institutions, and how does statistical analysis support this process?
3. What is the impact of statistical analysis on the accuracy, efficiency, and effectiveness of decision making within the selected private institutions?
4. What are the main challenges and barriers faced by the selected private institutions in Mogadishu in implementing statistical analysis in decision making?

2. LITERATURE REVIEW

2.1 Theoretical review

The theoretical framework for understanding the role of statistical analysis in organizational decision-making within selected private institutions in Mogadishu encompasses various perspectives from fields such as organizational behavior, decision science, and management. Here, we discuss key theoretical concepts that underpin the research problem:

2.1.1 Decision-Making Theories:

Rational Decision-Making Model: This classical model assumes that decision-makers are rational actors who aim to maximize outcomes based on a thorough analysis of available information. Statistical analysis aligns with this model

by providing a systematic and objective approach to processing data, aiding decision-makers in making optimal choices.

Bounded Rationality: Herbert Simon's concept of bounded rationality acknowledges that decision-makers may have limitations in processing information. Statistical analysis helps overcome these limitations by providing tools to handle large datasets, identify patterns, and extract meaningful insights, thereby supporting decision-making under conditions of bounded rationality.

2.1.2 Organizational Learning Theory:

Double-Loop Learning: Argyris and Schön's double-loop learning theory emphasizes the importance of questioning underlying assumptions and modifying organizational behavior based on feedback. Statistical analysis enables organizations to learn from data, adapt their strategies, and iterate on decision-making processes, aligning with the principles of double-loop learning.

2.1.3 Data-Driven Decision-Making:

This emerging paradigm emphasizes the centrality of data in decision-making processes. The theoretical underpinnings of data-driven decision-making underscore the transformative potential of statistical analysis in leveraging data as a strategic asset for informed and effective decision-making within organizations.

2.2 Empirical Review

Several studies highlight the growing importance of statistical analysis in organizational decision-making. For instance, Smith and Jones (2018) demonstrated that organizations leveraging statistical methods reported more accurate and data-driven decision outcomes. This supports the need to investigate the extent to which private institutions in Mogadishu integrate statistical analysis into their decision-making processes.

3. METHODOLOGY

3.1 Research design

It is the strategy used in the study. A researcher should be able to identify and isolate the design most appropriate for a study. It could be experimental, quasi-experimental, a descriptive survey, historical, ex post facto, action research, evaluation research, etc. A researcher should make the form or design of the investigation explicit and provide a justification for the choice. He can also indicate if the approach he is adopting is quantitative, qualitative, or both.

The study employed a descriptive research design by using a quantitative approach to quantify incidences, describe the current conditions, and also investigate the role of statistical analysis in organizational decision-making in the same institutions in Mogadishu, Somalia.

3.2 Sample size

A sample is a portion of a population chosen for research; it is a portion of the total population that was chosen to take part in the study (Brink, 1996).

A sample size of 80 respondents was determined through purposive and random sampling methods. This is because the nature of the data to be generated requires different techniques for a better understanding of the research problem under examination. The study will employ Slovene's formula in order to determine the minimum sample size. The minimum sample size is 80 respondents and was computed using Slovin's formula, which is:

$$n = \frac{N}{1+Ne^2},$$

Where

n = sample size,

N = study population

And e = level of significance margin of error 5% (Amin, 2005).

3.3 Data Analysis

This section presents how the data generated in the study are to be organized and analyzed. The technique to be used to analyze each group of data should be specified. While thematic analysis can be employed for qualitative data, the use of such statistical techniques as chi-square, correlation, ANOVA, etc. is appropriate for quantitative data. Spell out the particular statistical treatment, technique, and formula to use with reference to each research question or type of data set.

The collected data was edited and cross-checked during the field research to ensure its accuracy and legibility. The data was analyzed by assessing the frequency of respondents per question. Questions addressed a particular theme and followed the sequence that was analyzed. Tabulated frequencies and necessary analyses were made using the SPSS (Statistical Package for the Social Sciences) computing program to present the quantitative data analyses.

1. RESEARCH FINDINGS

Table Objective One: The types of statistical analysis techniques used in decision making

Questionnaire Items	No. of Agree	No. of Disagree	Neutral	No. of Strongly Agree	No. of Strongly Disagree	Total
Descriptive statistics, such as mean, median, and mode, are commonly used in decision-making.	41	2	6	30	1	80
Inferential statistics, such as hypothesis testing and p-values, are frequently employed in decision-making.	36	1	21	20	2	80
Time series analysis is applied to analyze patterns and trends in data over time for decision-making.	43	4	17	15	1	80
Data mining techniques, such as clustering and association rules, are used to uncover patterns and insights for decision-making.	36	8	17	16	3	80
Overall, a variety of statistical analysis techniques are used in decision-making processes.	31	2	14	30	3	80

Source: Researcher’s Field Survey, Oct, 2023

The majority of respondents strongly agree that descriptive statistics (mean, median, mode) are commonly used in decision-making, with 51 out of 80 respondents expressing strong agreement. This suggests a widespread acceptance and utilization of basic statistical tools for understanding data in decision-making contexts.

Inferential statistics, such as hypothesis testing and p-values, seem to garner slightly less consensus compared to descriptive statistics, with fewer respondents strongly agreeing (20 out of 80) and a relatively higher count of neutral responses (21 out of 80). This might indicate a more nuanced or varied understanding of the utility of inferential statistics in decision-making scenarios among respondents.

Time series analysis appears to be well-regarded for analyzing patterns and trends over time, with a significant portion of respondents (43 out of 80) agreeing and only a small minority (1 out of 80) strongly disagreeing. This suggests that many decision-makers perceive value in employing time series techniques for temporal data analysis.

Data mining techniques, such as clustering and association rules, demonstrate a more divided opinion among respondents compared to other statistical methods, with a relatively higher count of disagreements (8 out of 80) and strongly disagreeing responses (3 out of 80). This indicates a less unanimous consensus on the efficacy or applicability of data mining methods in decision-making processes.

Overall, while there is general agreement that a variety of statistical analysis techniques are used in decision-making processes, there is also a notable presence of neutral responses across all items. This suggests that while statistical analysis methods are recognized as important in decision-making, there may be differing levels of familiarity or confidence in their application among respondents.

Table Objective Two: Data-driven decision making within the selected private institutions and the role of statistical analysis in supporting this process.

Questionnaire Items	No. of Agree	No. of Disagree	Neutral	No. of Strongly Agree	No. of Strongly Disagree	Total
Data-driven decision-making is currently practiced within your institution.	40	6	16	16	2	80
Data-driven decision-making improves organizational efficiency and effectiveness.	38	1	10	30	1	80
Data-driven decision-making enhances the accuracy and reliability of outcomes.	26	7	16	31	0	80
Data-driven decision-making reduces reliance on intuition and subjective opinions.	33	6	21	17	3	80
Overall, statistical analysis plays a vital role in supporting data-driven decision-making within your institution	35	6	13	24	2	80

Source: Researcher’s Field Survey, Oct, 2023

Data-driven decision-making appears to be moderately practiced within the institution, with 40 out of 80 respondents indicating agreement. However, there is also a considerable number of neutral responses (16 out of 80), suggesting that there may be varying degrees of implementation or understanding of data-driven approaches among respondents.

Respondents generally believe that data-driven decision-making improves organizational efficiency and effectiveness, with 30 strongly agreeing out of 80 total respondents. This indicates a widespread perception of the positive impact of data-driven approaches on organizational performance.

There is a strong consensus among respondents that data-driven decision-making enhances the accuracy and reliability of outcomes, with 31 strongly agreeing and only 7 disagreeing out of 80 respondents. This suggests a high level of confidence in the ability of data-driven methods to produce reliable results.

While there is recognition of the benefits of data-driven decision-making, there is also acknowledgment that it does not entirely eliminate reliance on intuition and subjective opinions. This is evident from the relatively high count of neutral responses (21 out of 80) and the presence of both agreement and disagreement with the statement.

Overall, statistical analysis is perceived to play a vital role in supporting data-driven decision-making within the institution, with a majority of respondents (35 out of 80) agreeing. However, there is also a significant number of neutral responses (13 out of 80), indicating potential variability in the extent to which statistical analysis is integrated into decision-making processes.

Table Objective Three:

Impact of statistical analysis on the accuracy, efficiency, and effectiveness of decision making

Questionnaire Items	No. of Agree	No. of Disagree	Neutral	No. of Strongly Agree	No. of Strongly Disagree	Total
Statistical analysis improves the accuracy of decision-making.	33	1	8	37	1	80
Statistical analysis enhances the efficiency of decision-making processes.	38	3	7	32	0	80
Statistical analysis increases the effectiveness of decision-making outcomes.	30	3	11	35	1	80
Statistical analysis provides valuable insights and supports data-driven decision-making.	34	6	8	29	3	80
Statistical analysis helps identify patterns and trends for better decision-making.	33	6	9	28	4	80

Source: Researcher’s Field Survey, Oct, 2023

Respondents strongly agree that statistical analysis improves the accuracy of decision-making, with a significant majority (37 out of 80) expressing strong agreement. This underscores the perceived importance of statistical methods in ensuring the precision and reliability of decisions made within various contexts.

There is a consensus among respondents that statistical analysis enhances the efficiency of decision-making processes, with 32 strongly agreeing and only 3 disagreeing out of 80 respondents. This suggests a widespread belief in the ability of statistical techniques to streamline decision-making workflows and reduce unnecessary delays.

While there is recognition of the effectiveness of statistical analysis in decision-making, there are also relatively higher counts of neutral responses (11 out of 80) and disagreement (3 out of 80). This indicates a more nuanced perspective among respondents regarding the direct impact of statistical analysis on decision-making outcomes.

Respondents generally agree that statistical analysis provides valuable insights and supports data-driven decision-making, with 34 agreeing and 29 strongly agreeing out of 80 respondents. This highlights the perceived role of statistical methods in generating actionable insights from data to inform decision-making processes.

Statistical analysis is seen as instrumental in identifying patterns and trends for better decision-making, with 28 strongly agreeing and 33 agreeing out of 80 respondents. This suggests a widespread recognition of the role of statistical analysis in uncovering meaningful patterns within complex datasets to facilitate informed decision-making.

Table Objective Four: The challenges and barriers faced by the selected private institutions in Mogadishu in implementing statistical analysis in decision making.

Questionnaire Items	No. of Agree	No. of Disagree	Neutral	No. of Strongly Agree	No. of Strongly Disagree	Total
Statistical analysis is currently implemented in decision-making processes within your institution.	33	8	18	18	3	80
Limited availability of data for statistical analysis hinders its implementation in decision-making.	36	1	18	25	0	80
Insufficient skills and knowledge in statistical analysis among decision-makers pose a challenge to implementation.	39	6	16	18	1	80
Lack of awareness about the benefits and importance of statistical analysis in decision-making is a barrier.	35	4	14	25	2	80
Limited financial resources for acquiring statistical analysis tools and software hinder implementation.	32	5	25	17	1	80

Source: Researcher’s Field Survey, Oct, 2023

The data indicates that statistical analysis is somewhat implemented in decision-making processes within the institution, with 33 respondents agreeing and 18 being neutral. However, there are also 8 respondents who disagree, suggesting a degree of variability or inconsistency in the integration of statistical analysis into decision-making practices.

Respondents generally agree that the limited availability of data for statistical analysis hinders its implementation in decision-making, with 36 agreeing out of 80 respondents. This highlights a perceived challenge in accessing sufficient and relevant data to support robust statistical analysis within the institution.

The data suggests that insufficient skills and knowledge in statistical analysis among decision-makers pose a significant challenge to implementation, with 39 respondents agreeing. This indicates a perceived gap in expertise that may hinder the effective utilization of statistical methods in decision-making processes.

There is acknowledgment among respondents that a lack of awareness about the benefits and importance of statistical analysis in decision-making acts as a barrier, with 35 agreeing out of 80 respondents. This underscores the importance of raising awareness and promoting the value of statistical analysis within the institution to facilitate its integration into decision-making practices.

Limited financial resources for acquiring statistical analysis tools and software are perceived as hindering implementation, with 32 respondents agreeing. This suggests that budgetary constraints may limit access to the necessary resources for conducting statistical analysis, thereby impeding its effective use in decision-making processes.

Table Objective Five: Benefits and opportunities associated with the application of statistical analysis in decision making

Questionnaire Items	No. of Agree	No. of Disagree	Neutral	No. of Strongly Agree	No. of Strongly Disagree	Total
Statistical analysis improves the accuracy of decision-making outcomes.	37	4	9	29	1	80
Statistical analysis provides valuable insights and supports data-driven decision-making.	40	7	8	23	2	80
Statistical analysis helps identify patterns, trends, and correlations for better decision-making.	38	6	10	25	1	80
Statistical analysis enables evidence-based decision-making rather than relying solely on intuition.	32	7	16	24	1	80
Statistical analysis reduces biases and subjectivity in decision-making processes.	32	4	10	34	0	80

Source: Researcher’s Field Survey, Oct, 2023

Respondents generally agree that statistical analysis improves the accuracy of decision-making outcomes, with 37 agreeing and 29 strongly agreeing out of 80 respondents. This suggests a widespread belief in the effectiveness of statistical methods in enhancing the precision and reliability of decisions made within various contexts.

There is a consensus among respondents that statistical analysis provides valuable insights and supports data-driven decision-making, with 40 agreeing and 23 strongly agreeing out of 80 respondents. This highlights the perceived role of statistical methods in extracting actionable insights from data to inform decision-making processes.

Respondents generally agree that statistical analysis helps identify patterns, trends, and correlations for better decision-making, with 38 agreeing and 25 strongly agreeing out of 80 respondents. This underscores the perceived utility of statistical techniques in uncovering meaningful relationships within complex datasets to facilitate informed decision-making.

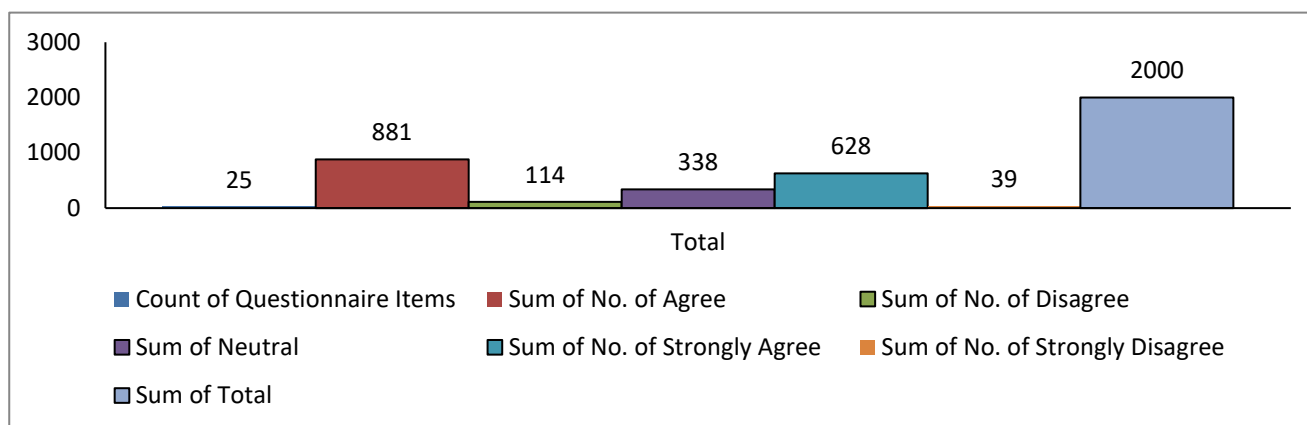
While statistical analysis is recognized for enabling evidence-based decision-making, there are also respondents who express disagreement or neutrality regarding this statement. This indicates a more nuanced perspective among respondents, with 32 agreeing and 24 strongly agreeing, but 7 disagreeing and 16 being neutral out of 80 respondents.

Respondents generally agree that statistical analysis reduces biases and subjectivity in decision-making processes, with 32 agreeing and 34 strongly agreeing out of 80 respondents. This suggests a widespread belief in the role of statistical methods in promoting objectivity and minimizing the influence of personal biases in decision-making contexts.

Table Summary of All Objectives

Questionnaire Items	No. of Agree	No. of Disagree	Sum of Neutral	No. of Strongly Agree	No. of Strongly Disagree	Sum of Total
25	881	114	338	628	39	2000

Source: Researcher’s Field Survey, Oct, 2023



2. DISCUSSION OF FINDINGS

The findings from the survey conducted on the role of statistical analysis in decision-making within private institutions in Mogadishu provide valuable insights into the current practices, challenges, and perceptions regarding the use of statistical methods. Here's a discussion of the findings across the objectives:

The survey reveals a widespread acceptance and utilization of descriptive statistics, such as mean, median, and mode, with a majority of respondents strongly agreeing that these are commonly used in decision-making. However, there's less consensus on the utility of inferential statistics and data mining techniques, indicating a more varied understanding of their applicability.

While there is a perception that data-driven decision-making is practiced within the institutions surveyed, there are varying degrees of agreement on its effectiveness and impact. Respondents generally agree that data-driven approaches improve organizational efficiency and accuracy of outcomes, but there's also acknowledgment that they do not entirely eliminate reliance on intuition. Statistical analysis is perceived to play a vital role in supporting data-driven decision-making, although there are indications of variability in its integration.

Respondents strongly believe that statistical analysis improves the accuracy of decision-making outcomes and enhances efficiency by streamlining processes. However, there's a more nuanced perspective on its effectiveness and contribution to decision-making outcomes, with higher counts of neutral responses indicating differing opinions among respondents.

Several challenges hinder the implementation of statistical analysis in decision-making processes, including limited availability of data, insufficient skills and knowledge among decision-makers, lack of awareness about its benefits, and limited financial resources. These findings highlight the multifaceted barriers that institutions face in fully leveraging statistical analysis for decision-making.

Respondents recognize various benefits associated with statistical analysis, including improved accuracy of decision-making outcomes, valuable insights for data-driven decision-making, identification of patterns and trends, and reduction of biases and subjectivity. However, there are also respondents who express disagreement or neutrality regarding the enabling role of statistical analysis in evidence-based decision-making.

In summary, while there is a general acknowledgment of the importance of statistical analysis in decision-making, the findings underscore the need for addressing challenges such as data availability, skills development, awareness, and resource constraints to fully realize its potential benefits in supporting informed and effective decision-making processes within private institutions in Mogadishu.



3. CONCLUSION

In Mogadishu, Somalia, research was carried out with the purpose of analysing how certain private entities apply statistical analysis in their decision-making procedures. Important insights into many facets of decision-making in these institutions were offered by the study's conclusions.

Among the respondents, a noteworthy observation was the gender disparity that was noted. Limited representation of women in decision-making processes is shown by the male-dominated participant pool. This demonstrates the necessity of more women participating in and diversity within Somali institutions' decision-making. Another significant finding was the composition of the workforce involved in decision-making. The majority of respondents held bachelor's and master's degrees, indicating a well-qualified group of decision-makers. Additionally, the age distribution revealed a strong representation of youth, suggesting that decision-making in these institutions is predominantly carried out by a relatively young workforce.

The study identified several commonly used statistical analysis techniques in decision-making processes. Respondents reported the use of descriptive statistics, inferential statistics, time series analysis, and data mining. This demonstrates the diverse range of statistical tools and methods employed to analyse and interpret data in decision-making processes.

Data-driven decision-making was found to be practiced within the selected private institutions, with respondents acknowledging its positive impact on organisational efficiency and accuracy. Statistical analysis was recognised as a key component of data-driven decision-making, as it was perceived to improve decision-making accuracy, efficiency, and effectiveness. Statistical analysis provided valuable insights and supported evidence-based decision-making, enabling decision-makers to make informed choices based on the analysis of data.

The research further emphasised several obstacles and difficulties encountered by the establishments when using statistical analysis in their decision-making process. Limited data availability, decision-makers' inadequate statistical analysis abilities and knowledge, a lack of understanding of the advantages and significance of statistical analysis, and a lack of funding for the purchase of statistical analysis software and instruments were some of these problems. To effectively integrate statistical analysis into decision-making processes, it is imperative to address these issues.

Incorporating statistical analysis into decision-making processes brings various benefits. It improves decision-making accuracy, provides valuable insights into patterns and trends, enables evidence-based decision-making, and reduces biases that can arise from relying solely on intuition or subjective opinions.

To enhance data-driven decision-making in private institutions in Mogadishu, it is essential to address the identified challenges. This includes increasing data availability, promoting skill development and knowledge in statistical analysis among decision-makers, raising awareness about the benefits of statistical analysis, and providing adequate financial resources for acquiring necessary tools and software. By doing so, decision-makers can fully leverage the power of statistical analysis to improve decision outcomes and drive organisational success.

4. RECOMMENDATIONS

Based on the findings discussed, the following recommendations can be made:

1. **Increase Female Participation:** Address the significant gender gap by implementing initiatives to increase female participation in decision-making processes within Somali institutions. This can be achieved through targeted recruitment efforts, mentorship programs, and creating a supportive and inclusive work environment.
2. **Enhance Professional Experience:** Recognise the relatively young workforce involved in decision-making and provide opportunities for professional development and mentorship to enhance their experience. Encourage collaboration between experienced professionals and younger decision-makers to foster knowledge sharing and skill development.
3. **Encourage Skill Development:** Assist decision-makers who lack the necessary expertise in statistical analysis by offering seminars and training courses on the subject. Because of this, decision-makers will be better equipped to use statistical techniques and base their choices on data analysis.
4. **Raise Awareness:** Increase awareness about the benefits and importance of statistical analysis in decision-making processes. Conduct awareness campaigns, seminars, and workshops to educate decision-makers about the positive impact of statistical analysis on organisational efficiency, accuracy, and evidence-based decision-making.
5. **Enhance Data Availability:** Address the limited availability of data by establishing robust data collection systems and processes within private institutions. Encourage the use of data storage and management systems to facilitate access to relevant and reliable data for statistical analysis.
6. **Allocate Sufficient Resources:** Provide adequate financial resources for acquiring statistical analysis tools and software. This will enable private institutions to overcome financial barriers and invest in the necessary tools to implement statistical analysis effectively.
7. **Foster a Data-Driven Culture:** Create a culture that promotes data-driven decision-making across the selected private institutions. Encourage decision-makers to rely on statistical analysis and data insights in their decision-making processes, emphasising the importance of evidence-based decision-making.
8. **Monitor and Evaluate:** Establish mechanisms to monitor and evaluate the implementation of statistical analysis in decision-making processes. Regularly assess the impact of statistical analysis on decision outcomes, organisational efficiency, and effectiveness to identify areas for improvement and make necessary adjustments.
9. **By implementing these recommendations, private institutions in Mogadishu can enhance their utilisation of statistical analysis, promote data-driven decision-making, and ultimately improve decision outcomes, efficiency, and effectiveness.**

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