Machine Learning as Managerial Tool: A Case Study in ADNOC

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ABSTRACT: In the current business environment, managers are facing challenges in managing different kinds of people. They find it difficult to track, evaluate, and manage employees in a fast-paced work setting. Machine learning is an emerging concept that deals with unsupervised and supervised learning of a machine to provide a usable system. In this matter, this paper aims to investigate how companies can leverage the use of machine learning in people management and in improving the performance, productivity, and motivation of employees and managers. Thus, the research used both qualitative and quantitative research approaches to examine the impact of machine learning in an organizational setting.

KEYWORDS: Artificial Intelligence, Big Data, Business Environment, Machine Learning.

1. INTRODUCTION

Machine learning is a new field in the big data domain that has become more significant in the management aspect. The competition in the corporate environment is extremely tough, thus, employees in managerial positions are often placed in enormously dire circumstances where they must cope with both internal and external factors. The performance of a company is directly impacted by external factors including the competitive market, ever-changing customer needs, inflation, and legislative laws. The internal factors such as management of the workforce, operational processes, and policy formulation also require management's focus.

According to [1], management is evolving into a more complex job role as most of the conventional management techniques may no longer be effective in the current business world. When it came to directing employees' work over the previous years, managers possessed almost total authority. Employees were required to comply with the managers' directions without enquiring about their justification under the prevalent authoritarian management style. Today's business environment, though, has transformed that. As per [2], businesses must make sure they recruit and retain excellent employees due to the highly competitive market. If these employees can be recruited by other companies, they cannot be kept in an authoritarian system. It necessitates the managers to adopt consultative management, such that they must be considerate and cooperative with their staff.

2. RESEARCH BACKGROUND

Companies could not dare to make bad decisions regularly in the competitive world of business. When it comes to addressing issues in the external environment, excellence is essential. Managers should then cope with extremely demanding workers in a very stressful external environment, and they should be addressed carefully to prevent them from considering leaving the company. Even among the most educated and skilled employees, success in a management position is no longer assured. Even in a very difficult work environment, businesses should discover strategies for success. According to [3], machine learning holds the promise of resolving significant managerial issues that businesses are currently experiencing. Managers cannot effectively meet the demand to accurately know the skills and the needs of a certain employee. Yet, with the use of machine learning, it is now probable to identify the areas where an employee has to improve.

2.1 Research Objectives and Hypotheses

This research aimed to investigate and examine the impact of machine learning in managing employees of Abu Dhabi National Oil Company (ADNOC). The research was centered on the managers of ADNOC to investigate the challenges that managers faced when handling the workforce. It also aimed to examine how machine learning can help managers and employees improve their performance at work. These abovementioned aims lead to the following research objectives:

1. To analyze how ADNOC can use machine learning to improve its employees' overall performance.
2. To examine how ADNOC managers can use machine learning to boost their performance.

For this study, the following hypotheses will be investigated:

1. Machine learning will enhance the company's performance through tracking, assessing, and modifying employee engagement initiatives.
2. By utilizing machine learning, the managers of ADNOC will improve their performance.

2.2 Significance of Research

With abilities exceeding those of a human, machines are evolving into providing better managerial solutions. Yet, it is evident that machines are not able to substitute individuals in management roles [4]. In today's challenging world of business, it can, nevertheless, simplify tasks and improve accuracy. To increase the organization's chance to succeed, machine learning can provide managers the ability to grasp their present surroundings and make precise future predictions. The significance of this research is due to this. It will demonstrate how ADNOC's managers can rely more on technologies to make better managerial decisions.

3. LITERATURE REVIEW

According to [5], machine learning is an emerging concept in the field of information technology that can be used to attain an extensive understanding of the data patterns in an unsupervised or supervised learning manner and turn these patterns into a usable system. Machine learning could be used in making decisions regarding the quality of crops, detection of diseases and infections, management of soil and water, etc. It is typically regarded as a subsection of artificial intelligence (AI), a field of study involving engineering and the science of making intelligent systems [6].

As businesses look for innovative approaches to succeed, machine learning is growing in importance as a research topic. [7] stated that managers' responsibilities are getting more complex in present-day businesses and that strategies for improving their effectiveness are required. In the future, when the time comes to make decisions based on big data, machine learning aims to overcome the majority of the issues that managers currently experiencing. Finding gaps in the existing literature and developing hypotheses that can be tested using primary data obtained from the participants will be facilitated by thoroughly looking at what researchers have discovered about this subject.

Similarly, [8] asserted that it is improper to frequently associate the term artificial intelligence with machine learning. Artificial intelligence is the capacity of devices to carry out tasks intelligently, whereas machine learning is a concept that states that by providing machines with data accessibility, they could even learn from one another. Through machine learning, the machines are given more capabilities to perform jobs that should only be performed by people. Artificial intelligence is presently being driven by machine learning, which will allow machines to be more autonomous and capable of producing the desired results [9]. Instead of attempting to teach machines, all they need is to know how things work as well as how to accomplish duties, [3] notes that it could be necessary to teach the machines to study and understand for themselves. Machine learning highlights the need to code computer systems in a manner that they will always think and behave like just human beings, and then provide them with access to data that will guide their judgment [10]. It is a more effective use of technology, according to experts. When performing tasks that are assigned to machines, they are superior to people in terms of speed, precision, consistency, as well as other theoretical and practical variables. It is assumed that if machines are given the freedom to learn and behave without being heavily influenced by humans, they will likewise be more successful at making judgments.

Considering that humans fall short of perfection, computers are introduced as a substitute that is designed to compensate for human flaws. [11] contend that when utilizing machines to manage judgments, all parties involved will be informed that the rules must be properly followed because the machines will not show any preference. Regarding employee performance, the machines will provide precise information on how each employee performed concerning the predetermined targets. It will be evident to anyone who is should be terminated when such a company has a system set up where underachievers must be fired [12]. If an employee is fired against their will, these systems prevent finger-pointing scenarios. Before adopting this system for managing the workforce, everybody should be made aware of the new evaluation framework and the expectations for each individual. Every employee will see their performance evaluation and any machine-generated recommendations for their role within the organization after the predetermined period. The employees would feel more accountable because they are aware that there would be no favoritism-related

instances. The technology also gets rid of problems brought on by fraud, prejudice, discrimination, and errors generated by showing pity when it wasn't called for [13].

4. RESEARCH METHODOLOGY AND DESIGN

The purpose of this section of the article is to describe the methodologies that were employed in data collection and analysis from a variety of sources. Data were obtained from primary and secondary sources by the researcher. Secondary sources of information were crucial in giving the research context and direction. Publications, research papers, and credible sources on the internet provided the secondary research data. They served as the foundation for the literature review and directed the research topic. Primary data from survey participants were gathered, and it was used to support the claim and objectives of the study.

The overarching approach a researcher takes in a particular study should be based on the objectives that need to be met. [1] claim that selecting the appropriate research design is essential to guarantee that the appropriate data is gathered and processed to support the study's recommendations based on the findings. The main objective of this research was to ascertain how machine learning could be utilized to enhance company performance through tracking, assessing, and modifying employee engagement activities. The researcher decided to employ both qualitative and quantitative research to accomplish the research objectives. Through a survey method, a sample of 20 survey participants provided the primary data that will be addressed hereunder. After the data was gathered, several analyses were performed to produce results that would support the research hypotheses. It was believed that descriptive analysis was crucial in demonstrating the applicability of machine learning in an organizational setting.

Since machine learning is a new concept in the UAE it was crucial to gather responses from participants who had experienced its effects or are familiar with it in the workplace. The target population in this study is the managers of ADNOC who have a background knowledge of using information technology for people management. The 50 survey participants were chosen through simple random selection by the author. The participants were chosen based on their suitability, desire to participate in the study, and familiarity with the idea of machine learning. The researcher used an online questionnaire to gather data from the survey participants after selecting them randomly. Due to the short amount of time that was available to accomplish the study, it was determined to be the best strategy.

5. THE RESEARCH INSTRUMENT

The application of machine learning serves as the independent variable for this study. Whereas, the function of leadership and management in an organizational setting is the dependent variable. The main goal is to assess how the management of workers within an organization could be impacted by machine learning. The relation can be evaluated by applying statistical techniques. The magnitude of the relationship between these factors will be interpreted by the researcher. The analysis will also support the hypotheses if it can be shown that such factors are closely related.

The obtained data were quantitatively processed to assist in uncovering the participants' perspectives. The quantitative analysis was made easier with the aid of a Microsoft Excel Application. Charts were used to illustrate the assessment's results. In addition to quantitative methods, a qualitative approach was crucial to the study. The usefulness of machine learning in ADNOC has been observed by several of the participants who hold managerial positions. While some of them believe this new idea is crucial and would enhance their managing duties, some are wary about it. It was believed to be crucial to capture their various points of view through a qualitative approach. It assisted in clarifying why machine learning has not yet gained widespread acceptance in the UAE despite its growing importance as an instrument for managing people.

6. DATA ANALYSIS AND RESULTS

Focusing on the data gathered from the respondents, the researcher presented the descriptive analysis in this chapter of the article. Obtained from the primary data, the two survey questions are addressed in this chapter. The hypotheses are also investigated to see if the survey participants think that machine learning can be employed to track, assess, and modify employee engagement initiatives to increase the chance of success of the business.

- Survey Question 1: What are the common challenges that managers encounter in today's business organization?

The first question sought to identify the key challenges that managers today have in their duty as coordinators and disciplinarians of the workforce. It was found in the literature review that management in the present organizational system has undergone a significant transformation. Managers have particular problems that call for particular responses. Key challenges that managers must overcome in the modern work culture are shown in Figure 1:
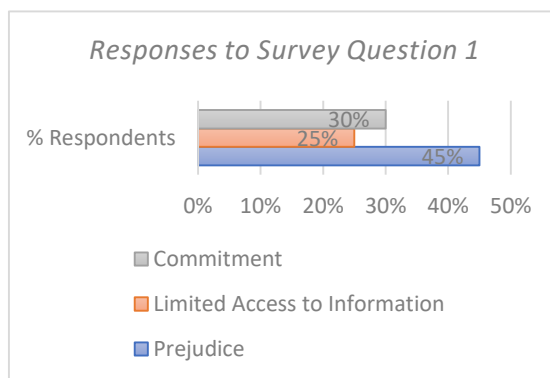

Figure 1. Key Challenges that Managers Often Encounter in Modern Work Environment

The majority of participants (45%) believed that one of the top problems managers in their companies has to manage is prejudice and unfairness. It frequently happens that a manager will feel obligated to give a group of employees biased handling of a situation for a variety of factors. The manager's closeness with a few colleagues can occasionally make it tough for them to hold a stance that would be detrimental to these individuals. This manager will have his or her decisions and deeds affected. When these employees don't live up to expectations, rather than issuing notices as well as disciplinary actions as would be the appropriate thing to do, they'd choose to disregard the problem out of concern for the relationships. Due to the demoralizing effects that these favoritism-based acts will have on other employees, they may have a substantial influence on the performance of a company as a whole.

Everybody should strive to be committed if they want to live happy, meaningful lives, but commitment can be difficult to maintain. To best serve the company, people management sometimes requires one to make difficult, tough choices. An individual may not become an effective manager if they are not committed enough to manage employees. The participants also mentioned that having little access to information can occasionally present difficulties for managers in their companies. Management requires information to help them in decision-making processes before they can take action. With insufficient information, inevitably, the decisions made by this management wouldn't be the best option. These issues could cost a company a lot of money.

- Survey Question 2: Can machine learning boost employee performance, motivation, and satisfaction?

The purpose of the second question was to find out how businesses may leverage the idea of machine learning to boost employee performance, motivation, and satisfaction. The participants were asked if they thought machine learning could solve managerial issues. Their responses are shown in Figure 2 below:
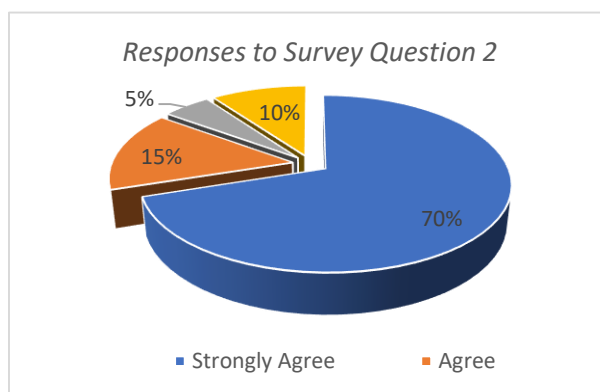

Figure 2: Machine learning boosts employee's performance, motivation, and satisfaction

The vast majority of participants (70%) strongly agreed with the proposition that machine learning can enhance the employee's motivation, performance, and satisfaction. It enhances the procedure for gathering, examining, and disseminating data that is required for efficiency reasons. As employees are given access to key information that can give guidance for their activities, performance will be enhanced. Using enhanced channels of communication, enables them to participate in constructive discussions with the managers. Employee motivation and satisfaction will improve when machine learning reduces management flaws and fosters equality within a company. They will understand that their advancement in the company and future depends more on their skills and dedication than on corrupt practices and unfairness.

- Survey Question 3: Can the managers of ADNOC improve their performance by utilizing machine learning?

The third question obtained information as to how managers may use machine learning to enhance their performance at work. The participants were asked questions about their views on whether machine learning helps enhance managers' performance in people management. Their answer is shown in Figure 3 hereunder:
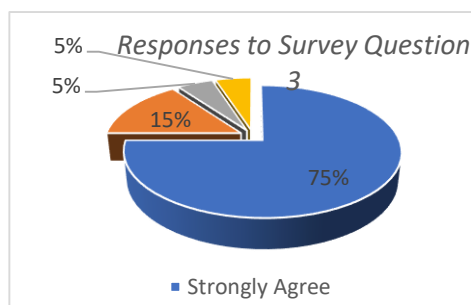

Figure 3: Machine learning can help boost a manager's performance

The majority of participants (75%) strongly agreed with the claim that machine learning can aid in enhancing managers' work performance. They explained how key staff inefficiencies related to human behavior, such as envy and unfairness, might be eliminated via machine learning. Additionally, it increases judgment accuracy, especially as it concerns generating predictions.

- Survey Question 4: Can machine learning enhance the performance of the company?

The study then concentrated on examining primary data to support or refute the originally proposed assumption. The author questioned the participants about their opinions on whether machine learning may boost a company's performance concerning the research objectives. Their responses are illustrated in Figure 4:
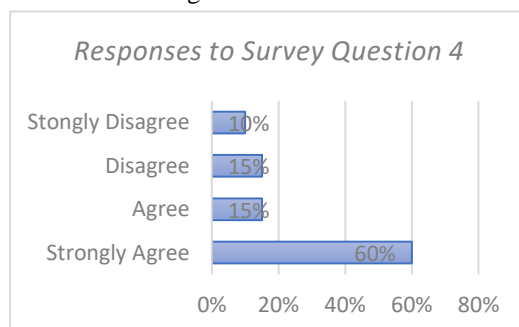

Figure 4: Machine Learning Boosts Company's Performance

According to the statistics in Figure 4, the majority of participants (60%) believe that machine learning helps boost the performance of the company. They argued that machine learning could facilitate the process of keeping track of, evaluating, and revising performance management initiatives. Therefore, their response verifies the aforementioned hypotheses.

7. DISCUSSION

The idea of artificial intelligence is among the key aspects that anyone must not neglect when investigating machine learning, as per the evaluation of primary data and literature review. [14] defines AI as intelligence shown through computers. Living things (humans

and animals) are expected to exhibit intellect under typical conditions. For such biological things to keep an eye on their surroundings, find food, and stay safe, they require some sort of intelligence. However, as technologies have developed, a framework for machine learning and artificial intelligence has emerged.

Machines now can solve problems due to better computer coding technology. It is anticipated that for machines to finish a job, people must provide them with commands. It has long become the situation that machines are employed to improve humanity's style of living. Nevertheless, the potential for such machines to independently decide depending on external influences has not been reassured. Machines are unable to make judgments on their own; they require human input. They are incapable of making logical conclusions since they're not living creatures. They are not compassionate enough to behave humanely [15]. However, developments in information technology indicate that this will evolve.

This paper makes a compelling argument for the immediate need for a significant change in management strategy in modern organizations. Businesses could not dare to make bad decisions over and over again, specifically when it comes to managing employees. A manager may occasionally need to make a challenging choice that would not be widely supported in the company. The management may also have to take into account a lot of aspects because of a variety of influences that could lead to the necessity to make such a tough decision. Without machine learning, a company might terminate a worker who had certain concerns been resolved, could have been a top talent [3].

The ability to get information from managers in ADNOC was one of the key limitations encountered when undertaking this investigation. It would've been crucial to undertake private and personal interviews with some of the managers to analyze the actual phenomenon in the adoption of these advanced technologies in the nation. During these interviews, the managers can discuss the internal procedures in their businesses, the difficulties they encountered, and the strategies they already had in place to adopt machine learning in managing the workforce.

Future studies must concentrate on how machine learning is used effectively in businesses like ADNOC. Studies already in circulation describe ways it is being used in American and European businesses, but little is known regarding how it is being used throughout the UAE.

8. CONCLUSION

The idea of machine learning is becoming more significant in the present organizational context. For a considerable length of time, ease of work has been achieved through the use of machines. Machines previously would have to depend on the choices made by the humans who controlled them. But the moment has arrived when machines can make choices on their own, free from human interference. In machine learning, machines are programmed to function similarly to human brains, given access to information that can speed up knowledge acquisition, and given the freedom to decide for themselves. The discipline of management is one of the domains where machine learning is gaining considerable significance. In the course of their daily work, managers encounter many difficulties.

To protect the company, they may need to make unpleasant decisions. They occasionally make poor decisions because of their lack of information. Additionally, managers' shortcomings, such as being biased toward other employees, can occasionally cloud their judgment when it comes to making crucial decisions for people management. To improve the performance of the managers in their organizations, it is critical to find solutions to these problems. To handle employees without being impacted by the issues abovementioned, machine learning is used. Additionally, it improves forecasting precision. Managers can quickly and accurately analyze vast and complicated data sets using machine learning. In today's highly competitive corporate world, the new solutions cannot be disregarded.

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