

## **Towards A Framework for Performance Management and Machine Learning in A Higher Education Institution**

**Dr. Shaik Balkhis Banu<sup>1</sup>**

<sup>1</sup>Assistant Professor, Department of Physiotherapy, Fatima College of health sciences Al Ain UAE  
drshaikbalkhis@gmail.com  
Orcid id: 0000-0002-8783-5275

**Dr. K. Suresh Kumar<sup>2</sup>**

<sup>2</sup>Associate Professor, MBA Department, Panimalar Engineering College, Varadarajapuram, Poonamallee,  
Chennai - 600123  
pecmba19@gmail.com  
<http://www.orcid.org/0000-0002-3912-3687>

**Dr. Priya J<sup>3</sup>**

<sup>3</sup>Assistant Professor, Department of Professional Studies, CHRIST (Deemed to be University), Bangalore, Karnataka  
priya.j@christuniversity.in  
<https://orcid.org/0000-0003-3263-6356>

**Mohammed Rizvi<sup>4</sup>**

<sup>4</sup>Independent Researcher, Information Technology Chicago, IL USA  
Mrizvi0310@gmail.com

**Shailendra Kumar Rai<sup>5</sup>**

<sup>5</sup>Research Scholar, School of Commerce and Management, IIMT University Meerut Uttar Pradesh  
rais6316@gmail.com

**Dr. Priyanka Rana<sup>6</sup>**

<sup>6</sup>Associate Professor, School of Commerce and Management, IIMT University Meerut Uttar Pradesh  
ranaphd81@gmail.com

### **Abstract**

Performance management is a process that helps an organisation to manage its performance. Therefore, there are three stages of performance management such as coaching, corrective action, and then termination. A proper performance management process is very important for the development of a higher education institute. Apart from that, machine learning is another important process that is based on software technology. Therefore, machine learning helps to predict the outcomes of learning. There are a total of four types of algorithms of machine learning such as unsupervised, supervised, semi-supervised, and reinforcement. Furthermore, the use of performance management helps to enhance the productivity of the students of higher education institutions. In addition to that, the use of machine learning in higher education institutions is also helpful to enhance the productivity of the students. As both of the processes are efficient to gain knowledge about several things, therefore it helps to enhance the productivity of the students of higher education institutions.

On the other hand, the purpose of this particular research study is to create a framework for machine learning and performance management in a higher education institution. Therefore, the framework is efficient and effective to understand the concept of research topics. Furthermore, the Framework for machine learning and performance management will help the students of higher education institutions to understand the impacts of these processes on their productivity. Apart from that, the researcher has used several types of methods and techniques for collecting and analysing all the data about the particular research topic. Thus, the researcher has adopted secondary methods for gathering more information and data about the

research topic. Along with that, the researcher has used qualitative techniques for analysing all the data in this particular research study.

**Keywords:** strategic, human resource management, system, resource based, assessment

## INTRODUCTION

**Performance management** can be defined as the procedure of focusing and assessing the procedure of activities and outputs of the activities that can help to achieve the goals of the targeted fields. Performance management helps the higher education institutions to improve the educational system of students and increase the value of the institute. In this case, there is also the importance of machine learning. Machine learning is the method of data analysis that automates analytical model building. It has many techniques that can help to analyse information about the institute. In this study, machine learning and performance management are described in higher education institutes.

Importance of Performance management in the higher education institution

There is the major importance of **performance management** in higher education institutions. In institutions, there are many employees and they should focus on their performances to improve their working skills and also to achieve the aims of institutes. As per the view of Alsarayrah and Alsarayrah (2021), the performances of the employees of institutions can be increased through commitment and motivation, and also rewarding. **Performance management** is most important in institutions and it helps to boost the institutes' profitability and it also increases the interest of students to be admitted in those institutions. It ensures that the teachers are capable of educating higher students. Through detecting and evaluating knowledge and skills, teachers of higher education institutions create special programs and give lessons to other students about that. **Performance management** of higher education institutes is focusing on the capabilities to handle the institute and students of the institute.

In this case, higher education institutes marketing management improves their performance to increase students in their institutes and also teachers improve their skills to increase their performances to educate students properly. As opined by Kroll (2017), institutes improve their knowledge and determine gaps in their skills and it is called **performance management** in institutions. This kind of improvement and enhancement can improve the capabilities to manage students of the institutes and help teachers to learn them properly. Institutions also focus on their economic performances and manage to enhance the turnover of institutions. Performance management can reduce the risks of the institutions and boosts the morale of institutions. It increases the retention of employees, teachers, and also the students of institutions. According to the view of Alsarayrah and Alsarayrah (2021), **performance management** can reduce the barriers of communication and improves the education of the institutions. It increases the efficacy of teachers of the institutions and it helps to provide more knowledge to others.

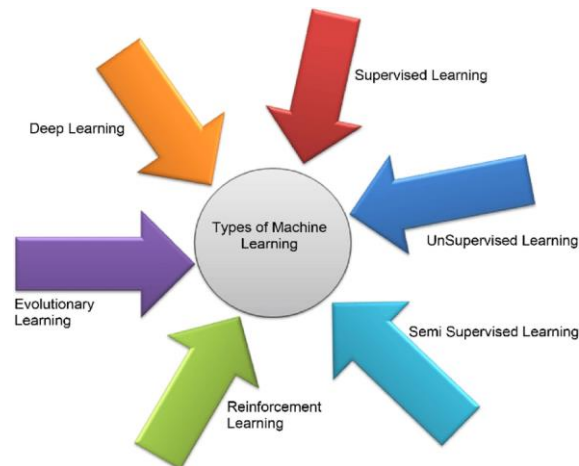


**Figure 1: Performance Management Process**  
(Source: Influenced by Alsarayrah and Alsarayrah, 2021)

## MACHINE LEARNING IN THE HIGHER EDUCATION INSTITUTION

**Machine learning** is the technique to analyse and evaluate the information of the institution and also other information that can help to achieve the aim of the institution. As per the view of Popenici and Kerr (2017), there are some **machine learning techniques**, which have many advantages in an institution. Those techniques are regression, clustering, classification, dimensionality reduction, deep learning, neural nets, reinforcement learning, transfer learning, ensemble methods, and so on. Those techniques help to develop the learning experiences of people and improve the ability to analyse the management of campus at all levels. It also helps in better task organization and also it helps to give training to others. Machine learning is mainly increasing knowledge of technologies to improve the institute's sustainability and capabilities. In the case of institutions, machine learning helps to increase the interest of students and inspires students and teachers both to learn new things and also educate others.

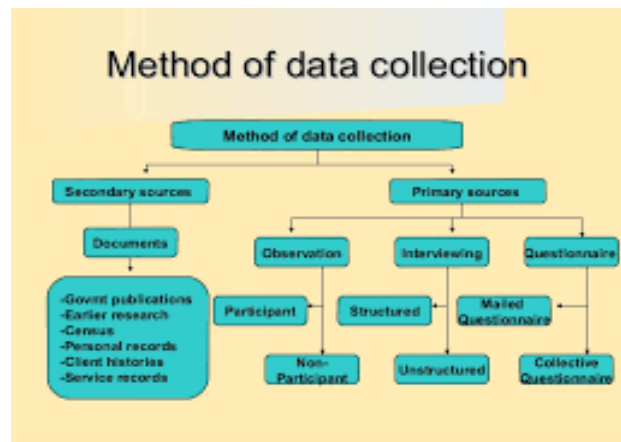
gives the opportunities to institutes to improve their technologies and technological knowledge. It also enhances the scope of development and it is best for education. It helps to transform education and it fundamentally changes the learning process, teaching process, and research procedure. As per the view of Alyahyan and Düşteğör (2020), machine learning makes educators more engaged and helps them to retain. In addition, it accommodates different and multiple styles of education. It also influences and encourages collaboration as well as offers immediate feedback for teachers. Machine learning helps to improve the capabilities of students of the institutions and prepare them for the future. Machine learning is used in an institution to improve software and to make more accurate predictions about outcomes without being explicitly programmed to do so. Machine learning helps the students and also the higher education institutions to improve their ability of learning and sustainability.



**Figure 2: Types of Machine Learning**  
(Source: Inspired by Ruggiano and Perry, 2019)

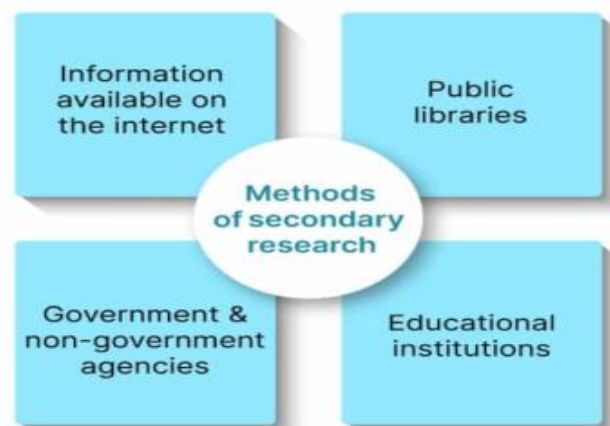
### METHODOLOGY

In this research paper, some methodologies are used to improve the quality of the research and gather information on this topic. There are two kinds of methods of data collection and more sampling methods for choosing participants in the research. Needless to say, research methodology is most important to collect and analyse information on the particular research topic. Primary data collection method and secondary data collection methods are two methods of data collection and both are useful for the research work. In this research work, a secondary qualitative data collection method is used. According to the view of Ruggiano and Perry (2019), a secondary qualitative data collection method is gathering characteristics information of a particular topic



**Figure 3: Data Collection Method**  
 (Source: Influenced by Doyleet al. 2020)

In this research work, the journals, books, articles, research papers, news, websites, and so on are used to collect information about machine learning and performance management in higher education institutions. The research is designed through descriptive research design. As mentioned by Doyleet al. (2020), descriptive research design covers all the details of the particular topic and describes the topic properly with appropriate information. In this research work, a secondary qualitative data analysis method is used. This research work is followed by a proper way to collect data then create a framework of research work and then analyse and evaluate the information of a particular topic. Needless to say, secondary data analysis methods can examine and review many articles and generate informative research work.



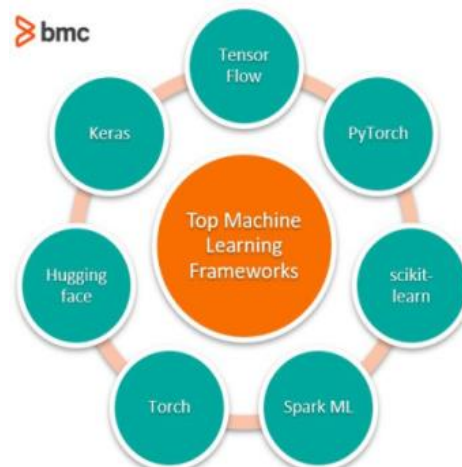
**Figure 4: Secondary Data Collection Sources**  
 (Source: Inspired by Reinhartz, 2020)

As per the view of Reinhartz (2020), there are many ways to analyse information of the research topic and those are document study, observation, article review, systematic review, thematic analysis, and so on. In this case, thematic analysis is used to improve the quality of the research work. Thematic analysis is the process of data analysis where some themes are generated and examine a particular topic then provide proper information of the topic. Secondary analysis is the easy way to get information about the topic and generate creative and critical information about the topic. In this case, machine learning and performance management's importance in higher education institutions is the topic of this research work. As per the result of the data analysis of this research work, machine learning and performance management can increase the value of institutions in the marketplace and attract students to the institutions.

## RESULT AND DISCUSSION

As per the view of Logan (2020), secondary data analysis is the way to analyse information through reading, reviewing, measuring, and evaluating the information of some articles, journals, books, and other sources. It is the easiest way to collect information and generate a research paper as researchers want. In this secondary analysis, the researchers made some research questions and met those properly. In this research work, three research questions are generated about machine learning impact, performance management impact, and higher education institutions' importance in society. Through the secondary data analysis process, those questions can be made.

As per the result of this research, it can be defined that machine learning is used in educational institutions to improve the performance of teachers and other employees. There are many frameworks used in different institutions and it improves the performances of institutions. In some institutions of India, many kinds of machine learning tools are used to measure the performances of employees and teachers in the company. As per the view of Rajanet *al.* (2018), machine learning is used by the Indian *Institute of Technology of Madras, Bombay, Delhi, Kharagpur, Kanpur, Hyderabad, and Roorkee*. This university uses machine learning tools and technologies in its institutions to assess the performances of employees and teachers. On the other hand, it is also used to provide knowledge of technologies to students. There are some frameworks that help to measure performance and some frameworks that help to manage performances through proper coding of *Keras, Torch, Hugging face, Spark ML, PyTorch, TensorFlow*, and so on.



**Figure 5: Machine Learning Frameworks**

(Source: Inspired by Chenet *al.* 2019)

**Performance management** helps the institutions to improve the value of the institution and gain students in the institutions. Proper use of technologies helps the institutions to improve their work capabilities and increase their students' ability to learn new things. Technologies and machine learning techniques help the institutions to manage the performances of the students and teachers of the institutes. According to the view of Chenet *al.* (2019), frameworks and coding of machine learning generate some new and creative technologies in the institutions to measure performances and also improve the awareness of institutions. In India, machine learning is used to provide knowledge of computer science and performance appraisal of people in institutions. In the report of 2020, the institutions of India increased technologies in their institutions to provide and offer more knowledge to other teachers and students.

**Performance management** helps the institutions to improve their work capabilities and also helps to achieve the aims of the organisation. In the words of Chen *et al.* (2019), machine learning has a major contribution to performance measurement and management. In higher education of IT, the students gain knowledge of machine learning and manage their learning

performance. In an institution, not only the performances of teachers are measured, but the performances of students are also measured through these kinds of machine learning processes.

#### Conclusion

From this above study, it can be concluded that machine learning has a role to improve the performance management of the institution. Performance management can improve brand value in the marketplace and the institution can gain more students. In this study, it is stated that India upgrades their technologies and generates creative technologies using machine learning methods. This research uses a secondary qualitative data collection and analysis method to increase the quality of the study. There are some benefits of machine learning in the institutions to improve their sustainability and capabilities. On the other hand, machine learning can assess issues of the institutions and manage the performances of personnel, teachers, and also students.

#### REFERENCES

1. Abdulmelike, A., 2017. Big Data and Human Resource Management Nexus: A Review and Future Direction. *Journal of Resources Development and Management*, 38, pp.7-11.
2. Ciampi, F., Demi, S., Magrini, A., Marzi, G. and Papa, A., 2021. Exploring the impact of big data analytics capabilities on business model innovation: The mediating role of entrepreneurial orientation. *Journal of Business Research*, 123, pp.1-13.
3. Dahlbom, P., Siikanen, N., Sajasalo, P. and Jarvenpää, M., 2019. Big data and HR analytics in the digital era. *Baltic Journal of Management*.
4. Garcia-Arroyo, J. and Osca, A., 2019. Big data contributions to human resource management: a systematic review. *The International Journal of Human Resource Management*, pp.1-26.
5. Mangla, S.K., Raut, R., Narwane, V.S. and Zhang, Z.J., 2020. Mediating effect of big data analytics on project performance of small and medium enterprises. *Journal of Enterprise Information Management*.
6. Müller, O., Fay, M. and VomBrocke, J., 2018. The effect of big data and analytics on firm performance: An econometric analysis considering industry characteristics. *Journal of Management Information Systems*, 35(2), pp.488-509.
7. Nisar, Q.A., Nasir, N., Jamshed, S., Naz, S., Ali, M. and Ali, S., 2020. Big data management and environmental performance: role of big data decision-making capabilities and decision-making quality. *Journal of Enterprise Information Management*.
8. Pera, A., 2019. Towards effective workforce management: Hiring algorithms, big-data-driven accountability systems, and organizational performance. *Psychosociological Issues in Human Resource Management*, 7(2), pp.19-24.
9. Singh, S.K. and El-Kassar, A.N., 2019. Role of big data analytics in developing sustainable capabilities. *Journal of cleaner production*, 213, pp.1264-1273.
10. Sousa, M.J., Pesqueira, A.M., Lemos, C., Sousa, M. and Rocha, Á., 2019. Decision-making based on big data analytics for people management in healthcare organizations. *Journal of medical systems*, 43(9), pp.1-10.