FUTURE TRENDS AND CHALLENGES IN EXPLAINABLE IN EMPLOYEE RETENTION USING ARTIFICIAL INTELLIGENCE

Dr.P.Naresh Kumar, Assistant Professor, MBA Department, Sarojini Naidu VanitaMahaVidyalaya, ,Hyderabad. Email: naresh.pothakamuri@gmail.com
Dr. J Divya, Assistant Professor, MBA Department, A V College of Arts, Science and Commerce, Hyderabad. Email:jdivya9015@gmail.com

ABSTRACT:
In today's competitive landscape, retaining top talent has become a critical challenge for organizations across industries. High turnover rates not only incur significant costs but also disrupt workflow continuity and hinder productivity. Through a comprehensive literature review, this research examines the various factors contributing to employee turnover and the existing methodologies employed by organizations to address this issue. It identifies AI as a promising tool for optimizing retention efforts by leveraging its capabilities in data analytics, predictive modelling, and personalized interventions. The study proposes a framework for implementing AI-driven solutions for employee retention, encompassing data collection, analysis, and action. Businesses may learn a lot about employee engagement, behaviour, and potential danger signs using predictive analytics, sentiment analysis, and machine learning algorithms. These insights enable proactive interventions, such as personalized training programs, targeted incentives, and pre-emptive retention initiatives tailored to individual employee needs.It emphasizes the importance of transparency, privacy protection, and fairness in utilizing AI algorithms for decision-making processes. Leveraging AI allows organisations to better understand their employees' changing requirements and preferences, which in turn encourages a culture of engagement, loyalty, and long-term commitment via targeted retention initiatives.

INTRODUCTION:

In today's competitive business landscape, where skilled talent is in high demand, retaining top-performing employees is more challenging yet more crucial than ever before. An effective employee retention strategy involves creating a work environment that fosters engagement, satisfaction, and loyalty among employees. In this era of rapid technological advancement and evolving workplace dynamics, organizations must continuously adapt and innovate their retention strategies to meet the changing needs and expectations of their workforce. By prioritizing employee retention, companies can not only reduce turnover costs but also enhance employee morale, productivity, and ultimately, overall business performance. Furthermore, HR orchestrates comprehensive onboarding and orientation programs that help new hires seamlessly integrate into the organizational ecosystem, fostering a sense of belonging and support from the outset. Through the administration of training and development initiatives, HR provides employees with opportunities to enhance their skills and advance their careers internally, contributing to their long-term commitment to the organization.Additionally, HR manages compensation and benefits packages that are competitive and equitable, reinforcing employees' sense of value and recognition. Through performance management systems, HR sets clear expectations, provides constructive feedback, and facilitates growth, bolstering employee satisfaction and retention. Moreover, HR spearheads initiatives to measure and improve employee engagement, promotes work-life balance, and implements recognition programs, all of which collectively contribute to fostering a positive workplace culture and bolstering employee morale and loyalty. Thus, by addressing these facets comprehensively, the HR department serves as a linchpin in the organization's efforts to retain its valuable talent pool.By harnessing AI technologies, companies can better understand their workforce dynamics, identify potential retention issues, and implement targeted strategies to address them.One of the key ways AI aids in employee retention is through organization. By pinpointing employees who may be at risk of leaving, HR departments can

proactively intervene with tailored retention initiatives.AI-powered talent management systems also play a crucial role in employee retention. These systems utilize machine learning algorithms to match candidates with positions that align with their skills, preferences, and career aspirations. By ensuring a better fit between employees and their roles, organizations can enhance job satisfaction and reduce turnover.These AI-driven tools can address common HR inquiries, provide on-demand training and development resources, and offer real-time feedback and recognition. By enhancing communication and engagement, AI-powered assistants contribute to a positive employee experience, ultimately fostering greater loyalty and retention.However, it's important to recognize that AI is a tool, not a solution in itself. Successful employee retention strategies require a human touch and strategic implementation. While AI can provide valuable insights and automation, fostering a supportive company culture, offering competitive benefits, and providing opportunities for growth remain essential factors in retaining top talent. Therefore, organizations should integrate AI technologies thoughtfully, complementing human expertise to create a holistic approach to employee retention.Artificial Intelligence (AI) contributes significantly to employee retention by enabling organizations to better understand, engage, and support their workforce. Here are some key ways AI enhances employee retention:

1. Personalized Recommendations: AI-powered systems can provide personalized recommendations for career development, training, and advancement opportunities based on each employee's skills, preferences, and career goals. By offering tailored development paths, organizations can increase employee satisfaction and loyalty, reducing the likelihood of turnover.
2. The models were able to predict employee retention by using different scales
   - We can evaluate employee retention actual and predicted values of employee
   - The programme is conducted by using dataset from the organisation
   - Employee retention can be conducted by using different ML models

REVIEW OF LITERATURE :

Employee retention has emerged as a critical concern for organizations worldwide, given its profound implications for productivity, profitability, and sustainable growth. Numerous studies have delved into the multifaceted nature of employee turnover.One of the primary determinants of retention is job satisfaction. Research by Locke (1976) and Herzberg (1968) established the significance of intrinsic motivators, such as challenging work, recognition, and opportunities for growth, in fostering job satisfaction and, consequently, reducing turnover. Conversely, dissatisfaction with job-related factors, (Mobley, 1977; Griffeth et al., 2000).Organizational culture and leadership also play a pivotal role in employee retention. Schein (1985) highlighted the influence of organizational norms, values, and leadership styles on employee engagement and commitment. Leaders who foster a supportive, inclusive environment characterized by transparent communication, trust, and empowerment are more likely to retain talent (Eisenberger et al., 1986; Bass, 1985).Moreover, the emergence of the Millennial and Gen Z workforce has prompted organizations to reassess their retention strategies. Research indicates that younger employees prioritize factors such as work-life balance, career development opportunities, and organizational purpose (Twenge, 2010; Lyons et al., 2012). As such, organizations must adapt their practices to align with the evolving preferences and expectations of these demographic cohorts. In recent years, advancements in technology, particularly artificial intelligence (AI), have offered new avenues for enhancing employee retention efforts. Furthermore, the effective integration of AI into retention strategies necessitates collaboration across multiple functions, including HR, IT, and senior leadership, to ensure alignment with organizational goals and values (Cascio&Montealegre, 2016).

STUDY OF OBJECTIVES:

- To learn more about IBM's staff retention rate.

- To identify the issues faced by IBM employees.
- To find out how a retention plan might lower turnover rates.

RESEARCH GAP:
Machine learning and deep learning algorithms can assess the accuracy of staff retention prediction. One way to forecast staff retention is via a deep learning model, but machine learning (ML) is also an option. An explanation of the role that each model type may play in completing this assignment is as follows: Despite CNNs' common use in image processing, they may be trained to transform structured data into a more usable manner. They have the potential to detect geographical trends in personnel records that more conventional ML models might overlook.

CURRENT SCENERIA:
Amidst the current landscape, employee retention has taken canter stage as companies navigate through remote work dynamics, changing employee expectations, and a renewed focus on well-being. With the widespread adoption of remote work due to the pandemic, organizations are reevaluating their retention strategies to accommodate flexible work arrangements and foster a sense of connection among distributed teams. Additionally, there's a heightened emphasis on employee well-being, with companies investing in mental health resources, wellness programs, and initiatives to support work-life balance. Career development opportunities and a strong organizational culture are also key drivers in retaining talent, as employees seek growth and a sense of belonging within their workplaces. Technology-driven solutions, such as AI-powered analytics and virtual communication tools, are aiding companies in predicting turnover risks, personalizing retention strategies, and maintaining employee engagement in remote or hybrid work settings.

CHALLENGES OF EMPLOYEE RETENTION USING ARTIFICIAL INTELLIGENCE:
1. Overreliance on AI: Relying too heavily on AI for employee retention strategies can overlook the human aspect of the workplace. Employees may feel undervalued or disconnected if their interactions with management become too automated.
2. Difficulty in Predicting Individual Needs: While AI can analyse large datasets to identify trends, it may struggle to predict the unique needs and preferences of individual employees. This could result in generic retention strategies that fail to address the specific reasons why employees choose to stay or leave.
3. Resistance to Change: Implementing AI-driven retention strategies may face resistance from employees who are unfamiliar or uncomfortable with new technologies. This resistance can hinder the effectiveness of these initiatives.
4. Ethical Concerns: Using AI to predict employee behaviour raises ethical questions about the extent to which employers should intervene in their employees' personal lives. Employers must strike a balance between using AI to improve retention and respecting employees' autonomy.

CASE STUDY :
Certainly! Let's delve into a detailed case study showcasing the successful implementation of AI for employee retention:

COMPANY: TECH INNOVATORS INC. (TII):
Background:
Tech Innovators Inc. (TII) is a rapidly growing software development company based in Silicon Valley. With a workforce of over 1,000 employees, TII prides itself on innovation and cutting-edge technology solutions. However, the company has been facing challenges with retaining its top talent, particularly among software engineers and data scientists.
CHALLENGES:

1. **High Turnover**: TII has been experiencing a higher-than-desired turnover rate, especially among mid-level and senior employees. This turnover has not only resulted in talent loss but also incurred significant costs associated with recruitment and onboarding
2. **Lack of Visibility**: HR managers at TII struggle to identify the underlying reasons for employee turnover in a timely manner. Traditional methods of collecting feedback, such as annual surveys, are not providing actionable insights into employee satisfaction and engagement levels.
3. **Competition for Talent**: The tech industry is highly competitive, with rival companies aggressively recruiting top talent. TII needs to differentiate itself as an employer of choice and provide compelling reasons for employees to stay with the company.

AI IMPLEMENTATION:

TII decides to leverage AI technologies to address its employee retention challenges. The company collaborates with AI solution providers to implement the following initiatives:

1. Predictive Analytics for Turnover Prediction:

- TII adopts AI-powered predictive analytics to forecast employee turnover. The system analyses various data sources, including performance reviews, engagement surveys, communication patterns, and external market data. By employing machine learning algorithms, the system identifies patterns and indicators associated with employees likely to leave the company.
- HR managers receive real-time alerts and insights about at-risk employees, enabling them to take proactive retention measures.

2. Personalized Career Development Plans:

- TII implements an AI-driven career development platform that provides personalized growth opportunities for employees.
- Using data on employees' skills, career aspirations, and performance evaluations, the platform recommends relevant training programs, mentorship opportunities, and project assignments.
- Employees feel supported in their professional development journey, leading to higher job satisfaction and loyalty to the company.

3. Natural language processing (NLP) algorithms:

- Identify sentiment trends, common themes, and areas of concern among employees.
- HR teams gain actionable insights into employee sentiment, enabling them to address underlying issues and improve overall employee experience.

RESULTS:

1. Reduced Turnover Rates:

- The implementation of AI-driven predictive analytics enables TII to identify and intervene with at-risk employees effectively.
- By addressing factors contributing to turnover proactively, TII experiences a significant reduction in attrition rates, leading to cost savings and talent retention.

2. Increased Employee Engagement:

- Personalized career development plans resonate well with employees, fostering a sense of empowerment and investment in their professional growth.
- Employees feel valued and supported by the company, resulting in higher levels of engagement, productivity, and commitment to organizational goals.

3. Data-Driven Decision-Making:

- TII's HR teams leverage insights from AI analytics to make data-driven decisions regarding retention strategies and workforce planning.

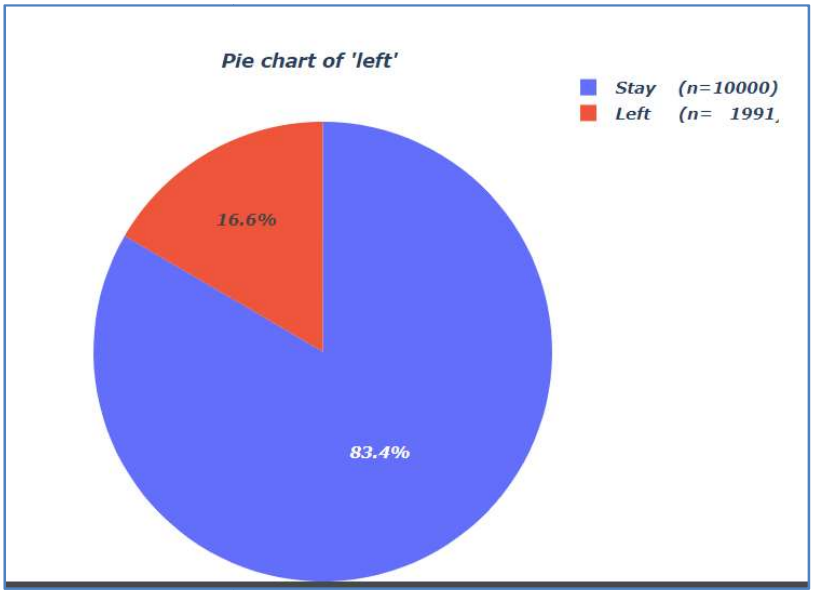
- By understanding the root causes of turnover and employee sentiment trends, HR managers can implement targeted interventions that address specific needs and concerns.

4. Enhanced Employer Brand:

- TII's successful implementation of AI-driven employee retention initiatives enhances its reputation as an employer of choice in the tech industry.
- The company attracts top talent and retains key employees, positioning itself as a leader in employee engagement and workforce management practices.

METHODOLOGY:

The headquarters of the multinational technology Additional objectives for innovators who produce several patents include reaching patent plateaus and becoming a Master Inventor. The highest professional honour one may get from IBM is to be named an IBM Fellow. The company has named a select number of Fellows yearly to acknowledge technical accomplishment since 1963. The Hundred Percent Club, which meets in Atlantic City, New Jersey, and is comprised of IBM salespeople who meet their quotas, and the Quarter Century Club, which was founded in 1924, are two examples of groups that recognise years of service. Every year, a thousand deserving IBM workers get the Best of IBM Award, which comes with a paid vacation to a distant location for the awards ceremony.IN my dataset collected employee retention data about 170 countries consulting companies over 2019 to 2023 of IBM employee



With its high accuracy, ability to handle large datasets, and feature importance estimation capabilities, Random Forest remains a go-to choose for many machine learning practitioners.

SUPPORT VECTOR MACHINE:

A strong family of supervised learning algorithms, In order for support vector machines (SVMs) to function, they must first choose the best possible hyperplane for data classification, one that maximises the margin between classes. For datasets with complicated decision boundaries and in high-dimensional domains, SVM shines. By regulating the margin width and the classification error with the regularisation parameter, SVM is able to limit overfitting, which is one of its primary strengths. With their reliable performance and robust findings, support vector machines (SVMs) have found use in many domains, including bioinformatics, picture classification, and text categorisation.

LIMITATIONS:

- This data set is confined to Kaggle website with reference to IBM
- This study confined to 5 years (2019-2023) of dataset only

EVALUTION MATICES:

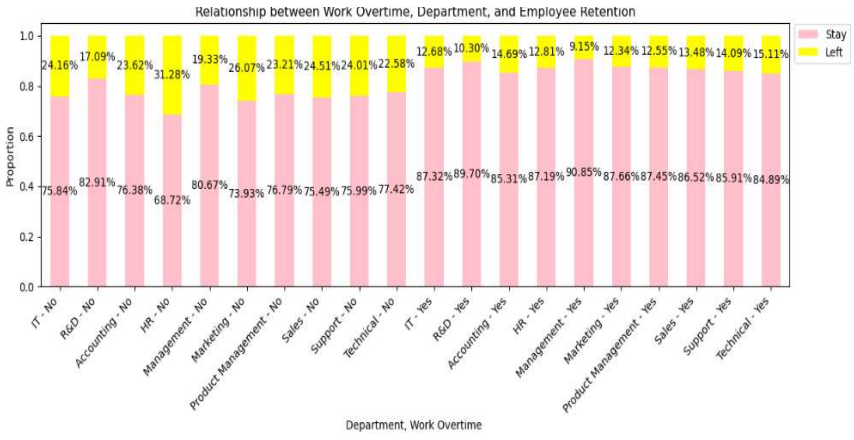
BOX PLOT:Box plots are valuable tools in employee retention analysis, offering a concise visualization of key metrics' distribution across different employee groups. By categorizing employees based on factors like department or job level and constructing box plots for each category, organizations can quickly identify trends and outliers that may influence retention strategies. Showing the data's variability, the middle line in each figure is the median, and the box is the interquartile range. Whiskers are used to draw attention to possible outliers by extending to the lowest and maximum values within a certain range. In order to improve overall retention rates, these visualisations help HR managers identify areas of success or concern and guide focused initiatives.

RESULTS AND DISCUSSION:

- There are more accurate values for random forest algorithm and support vector machines
- Logistic regression leads to misclassification
- XG boost and support vector machine leads to similar performances
- Comparing different scales to prediction of employee retention

	No Scaling		MinMaxScaler		RobustScaler		StandardScaler	
	Stay	Left	Stay	Left	Stay	Left	Stay	Left
Stay	1548	453	1540	461	1565	436	1541	460
Left	55	343	60	338	73	325	65	333

- Inbar graph employee retention rate are:



• A survey of machine learning algorithms for retention forecasting

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	ComplementNB		SVC (weighted)		XGBoost (weighted)		LightGBM (weighted)		Random Forest (weighted)	
	Predicted Stay	Predicted Left	Predicted Stay	Predicted Left	Predicted Stay	Predicted Left	Predicted Stay	Predicted Left	Predicted Stay	Predicted Left
Actual Stay	1172	829	1357	644	1979	22	1978	23	1997	4
Actual Left	106	292	115	283	27	371	27	371	30	368

FINDINGS:

- The retention rate is more accurate by random forest model
- The employees in the company left because of promotion and recognitions
- The strategy of employee retention is providing equal no of projects in the organisation

SUGGESTIONS:

1. Identify Risk Factors: Use AI to analyse employee data and identify factors contributing to turnover, such as job satisfaction, salary, or career development opportunities.
2. Predictive Modelling: Develop predictive models to forecast which employees are a trick of leaving based on historical data and current trends.
3. Personalized Interventions: Tailor retention strategies for individual employees based on AI insights, such as offering training, adjusting compensation, or providing mentorship opportunities.
4. Real-Time Feedback: Implement AI-driven systems to gather real-time feedback from employees, allowing organizations to address concerns promptly and prevent turnover.
5. Continuous Monitoring: Continuously monitor employee engagement and sentiment using AI-powered sentiment analysis tools to detect shifts in morale or job satisfaction.
6. Career Pathing: Utilize AI to map out potential career paths for employees within the organization, helping to increase motivation and reduce turnover.
7. Retention Incentives: Use AI to analyse the effectiveness of retention incentives and adjust strategies accordingly, ensuring resources are allocated where they will have the most impact.
8. Exit Interviews Analysis: Analyse exit interview data using AI to uncover common reasons for employee turnover and take proactive steps to address underlying issues.
9. Workload Management: Use AI algorithms to optimize workload distribution and prevent burnout, which can contribute to employee turnover.
10. Cultural Alignment: Leverage AI to assess cultural fit during the hiring process and identify candidates who are likely to thrive within the organization's culture, reducing turnover in the long term.

CONCLUSION:

Explainable AI is poised to revolutionize employee retention by providing HR teams with the insights they need to understand and address turnover risks. However, the technology must evolve to become more transparent, ethical, and accessible. Overcoming challenges related to model complexity, bias, data privacy, and user adoption will be critical in unlocking the full potential of XAI in this domain. The future of AI-driven employee retention lies in striking a balance between sophisticated algorithms and human-centric, explainable insights that empower better decision-making.From the above analysis there is more accurate values are obtained Based on the evaluation of the models, the Weighted Logistic Regression is considered the weakest classifier among the

models, regardless of scaling. This conclusion is drawn from its noticeably lower performance metrics, an inferior classification report, and a confusion matrix indicating a higher number of misclassifications. Similarly, for Complement NB and Weighted SVC.XGBoost, LightGBM, and Weighted Random Forest demonstrate similar performance metrics, but the Weighted Random Forest exhibits significantly lower misclassification rates. Therefore, the Weighted Random Forest is chosen for hyper parameter tuning using GridSearchCV.

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