

# An Empirical Study on Employee Engagement & Turnover Intention Among IT Professionals for Predictive Analytics

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**Abstract** - Employee engagement and turnover intention, especially in high technology industries such as Information Technology (IT), where there is intense competition as to who gets a skilled workforce, and the turnover is high. This paper will discuss how predictive analytics, in this case, various analyses used to control employee turnover and improve employee engagement strategies. The quantitative methodology was used, and a cross-sectional survey based on Likert scale was utilized to gather data on employee engagement, job satisfaction, workplace environment, and turnover intention. Regression, correlation, exploratory data analysis (EDA) and factor analysis were used to analyze the relationships between organizational factors and turnover intentions. The regression analysis showed the value of R<sup>2</sup> of 0.738; this means that there was a strong correlation between predictive analytics and turnover intentions but the p-value of 0.0620 meant that the null hypothesis (H<sub>0</sub>) that predictive analytics does not strongly influence turnover management could not be rejected. The analysis of correlation revealed that the turnover intention is negatively correlated with job satisfaction (-0.60), conducive working environment (-0.55), pay and benefits (-0.65), career growth prospects (-0.50) and work-life balance (-0.60). Exploratory Data Analysis (EDA) revealed that the employee engagement (29.3%) and job satisfaction (40.7) had the greatest influence on turnover intentions. Factor analysis also showed that predictive analytics is a moderately influencing factor in HR decision-making, as 250 of them strongly agreed that predictive analytics is a factor in more effective management approaches. The results suggest that while predictive analytics shows strong potential for enhancing HR decision-making, the relationship did not reach the standard threshold for statistical significance ( $p = 0.0620$ ). Consequently, the research acknowledges that organizational factors currently play a more primary role in turnover intentions than predictive models alone. On this understanding, the research adopted the alternative hypotheses (H<sub>1</sub>) that organizational factors and predictive analytics play an important role in turnover intentions and HR outcomes, which will help to develop more efficient employee retention measures.

**Keywords:** Employee Engagement, Turnover Intention, Predictive Analytics, Decision Making, Job Satisfaction, Employee Retention, Organizational Behavior

## I. INTRODUCTION

Employee engagement and turnover intention are important variables that highly determine the stability and prosperity of organizations, especially in industries that operate with speed like the Information Technology (IT). This rising application of in predictive analytics has allowed organizations to become more aware of and able to control these aspects. The empirical research on employee engagement and turnover intention in IT professionals through learning approaches aims at investigating how data-driven methods can be used to predict turnover intentions and improve employee engagement strategies. Employee data is being analyzed, patterns are discovered, and predictive turnover risks are estimated using various strategies, including job demands organizational support, employee emotions and cognitive engagement work (Van Heerden et al., 2022). This proactive ability enables the organizations to solve the retention problem before it occurs rather than after it has occurred, as an example, the engaged employees have lesser probability to leave their organizations (Memon et al., 2016). In addition, the study has focused on how resilience, supervisor support, and group identity affect turnover (Poku et al., 2025). These results imply that employee engagement is a matter of job satisfaction in addition to the organizational culture and support systems. Along with applying Various techniques in HR, this approach can provide IT companies with an effective instrument in the engagement management and turnover prediction that will eventually result in a more consistent and efficient workforce (Gutierrez et al., 2025).

The importance of employee engagement in defining turnover intentions has received positive interest in the organizational research, especially in highly competitive sectors of skilled professionals like Information Technology (IT) (Atingabili et al., 2025). High job demands, low career growth opportunities, and job dissatisfaction are common in IT professionals that may result in increased turnover

intentions (Pariyanti et al., 2025). Nevertheless, it is possible to reveal latent trends in the behavior of the employees by using various strategies to effectively perform predictive analytics, which will reduce the risk of turnover. It has been studied that work engagement is an important variable in lowering turnover intentions (Sudiarta et al., 2025). According to these studies, there is a direct linkage between the level of engagement and retention, which indicates that when employees become emotionally and psychologically committed to their work, there would be a low likelihood of them taking up other employment options. In this example, predictive analytics uses the data about the employees in the past to suggest possible turnover threats and disengagements. Investigations like those give evidence that strategy models are capable of using various factors that can be related to engagement to predict turnover intentions accurately (Eladl & Esenyel, 2025). This feature helps organizations to customize retention strategies, which is based on interventions that improve employee engagement and eventually minimize turnover (Aslantas, 2024). Therefore, the HR analytics can be taken as a promising solution to the most urgent problem encountered by IT organizations nowadays, which is retaining top talent.

This research is covered in various sections. Section I introduces the topic, and Section II describes the literature review based on previous research. And also included the problem statement, research objective, and research hypothesis. Section III explained the conceptual framework, followed by research methodology, research design tools and techniques, sample data collection, and demographic information. Section IV explained the results and discussion, the analysis section, and the key findings. Section V, the conclusion, summarizes the research.

## II. LITERATURE REVIEW

The engagement and turnover intention of employees are significant variables of the workforce stability, especially in high-technology sectors, such as Information Technology (IT), where the rivalry is intense, and the turnover rates are high. Data analytics have become relevant and powerful tools to project and control employee engagement and turnover in the past few years and can offer useful insights to HR management and decision-making. The way the organizations can use data-driven HR predictive analytics to predict employee turnover intention. Their analysis showed that employee data-driven predictive models that incorporate job satisfaction, performance and engagement rates can assist the HR person in making more successful talent management decisions. With the predictive insights combined into the HR practices, organizations are able to proactively mitigate turnover through offering specific career development schemes or enhancing workplace conditions (Kamaruzzaman et al., 2025). It also elaborates on predictive models that can be used to comprehend turnover intention. Which is suggested the use of grouped data to construct prediction models that provide insight into turnover intention depending on various demographic and organizational factors. The approach will provide more granular insight into turnover

intention and enable organizations to develop targeted approaches to reduce employee turnover (Yuan et al., 2024). To discuss the factors affecting the turnover intention in IT professionals. It has found various variables, such as job satisfaction, organizational culture, and work-life balance, which had a direct influence on turnover intention. Their empirical research revealed that poor working conditions and the absence of career advancement opportunities were the major predictors of turnover intention in the IT industry. This study emphasizes the need to know the underlying factors behind turnover intention and dealing with them in advance using organizational intervention (Farooq et al., 2022). The hybrid model that fuses ensemble learning with feature-based insights of IBM HR Analytics is considered. This study established that the hybrid method can be used to predict employee turnover with references to numerous factors, such as employee behavior, working environment, and individual traits. The model enhances the quality of prediction and also gives a more detailed way of dealing with employee turnover (Alyousef et al., 2026). It discusses the connection of the organizational learning culture, the work engagement and the turnover intention with Industry 4.0. Their results indicate that the high organizational learning culture is a key contributor to the employee engagement rate and low turnover intention. Organizations can enhance employee satisfaction and engagement through the provision of continuous learning and development opportunities, which eventually reduces the turnover probability. The study is specifically applicable to IT organizations that have to work in a dynamic environment where the constant skills growth becomes essential (Urrutia Pereira et al., 2022).

Their findings suggest that addressing these organizational factors can significantly reduce turnover intentions. Furthermore, the influence of job satisfaction and professional identity on turnover intention was explored, which found that job satisfaction and engagement serve as mediators that reduce turnover intentions among employees, especially in industries that rely heavily on skilled labor (Zhang et al., 2018). It's focused on IT companies and demonstrates how effective human resource practices, such as career development and recognition programs, lead to higher employee engagement, thereby reducing turnover intentions (Salunkhe et al., 2024). To extend this research, investigate the role of work engagement in counteracting turnover intentions among IT professionals (Wang et al., 2020). It is suggested that providing employees with a balanced work environment and adequate support can enhance engagement and reduce turnover intentions in high-demand sectors (Takawira et al., 2014). Recent studies have also expanded the scope of predictive modeling by incorporating factors like resilience and kinship into turnover prediction models. This highlighted the importance of resilience in reducing turnover intentions among healthcare workers (Park & Johnson, 2019). Most of the studies have studied the effect of polychronicity, job performance, and engagement on turnover intention in hotel employees (Kim & Lee, 2025).

*Problem Statement*

The rising turnover rate in the IT professional community is a major challenge for organizations, driving increased recruitment and training costs, lower productivity, and the loss of vital expertise. Although the current literature on employee engagement and turnover intention has expanded, the lack of insight into how predictive analytics can be successfully applied to detect and control turnover risks in the IT industry remains evident. The empirical research aims to investigate the correlation between employee engagement and turnover intention among IT professionals, particularly by using predictive analytics to forecast turnover intention and develop data-driven plans to improve employee retention in the sector.

*Research Objective*

OB-1: To investigate the notion and applicability of predictive analytics in the management of employee turnover.

OB-2: To determine the factors that can be identified as the most important in an organization and job-related factors that can determine turnover intention among employees.

OB-3: To examine how the independent variables chosen relate to the intention to leave the job by employees.

OB-4: To determine the relevance of predictive analytics in strategic HR Decision-making.

*Research Hypothesis*

OB-1: H0: Predictive analytics does not significantly influence the management of employee turnover, with no substantial relationship between predictive models and turnover intentions

H1: Predictive analytics significantly influences the management of employee turnover by accurately identifying key factors that contribute to turnover intentions.

OB-2: H0: Organization and job-related factors do not significantly correlate with turnover intentions among employees

H1: Organization and job-related factors significantly influence turnover intentions among employees, with specific factors playing a key role in determining turnover intentions.

OB-3: H0: There is no significant relationship between the chosen independent variables and employees' intention to leave their job

H1: There is a significant relationship between the chosen independent variables and employees' intention to leave their job

OB-4: H0: Predictive analytics has no significant relevance in strategic HR decision-making and does not contribute to improving HR outcomes.

H1: Predictive analytics has significant relevance in strategic HR decision-making and contributes to improving HR outcomes.

**III. CONCEPTUAL FRAMEWORK**

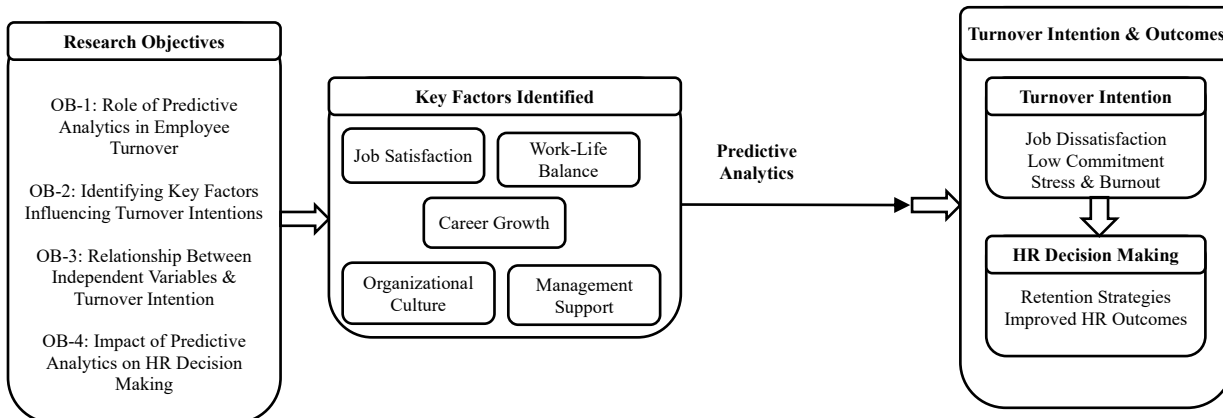


Fig. 1 Conceptual Framework

As depicted in fig 1, the engagement of employees and turnover intention are important variables that have a significant impact on the stability of the workforce, and high-technology organizations like Information Technology (IT) where talent competition is intense and turnover rates are generally high. This research framework will serve the purpose of answering a number of research questions based on predictive analytics to control employee turnover better. The initial research objective (OB-1) aims at gaining insight into the role and relevance of predictive analytics in employee turnover. With the help of historical data and

various techniques and strategies, organizations can predict who is most likely to leave and which factors influence turnover intentions. Aim number two (OB-2) will aim at establishing the most significance of organizational and work-related variables, including job satisfaction, work-life balance, career growth, and organizational culture that have a profound influence on turnover intention. The HR practices can directly have impact on these factors which are essential in retention.

The third objective (OB-3) looks at the relationship between independent variables including employee engagement, job satisfaction and relationships with supervisors and intention to leave jobs. Through these relationships, organizations are able to formulate specific interventions to work on these factors in order to mitigate risks of turnover. The fourth goal (OB-4) delves into how predictive analytics have influenced the HR decision-making process with a focus on how data-driven models can inform strategic HR practices, including retention, workforce planning and talent management. Predictive analytics may enable the HR staff to spend their resources and enhance retention by targeting the factors with the highest impact. This study has resulted in the identification of factors such as job satisfaction, work-life balance, career development, organizational culture and management support which are very crucial in affecting the turnover intentions. Through predictive analytics, organizations are able to predict these outcomes and prevent them by proactively dealing with them.

Predictive analytics uncovers in HR decision-making allow organizations to create retention strategies that are based on enhancing job satisfaction, engagement, and work-life balance. It is possible to customize these strategies to the needs of the employees that will boost retention efforts and increase the overall HR results. To sum up, the presented research framework demonstrates the importance of predictive analytics in the management of employee turnover and enhancing workforce stability.

### *3.1 Research Methodology*

This paper will utilize predictive analytics to examine how employee engagement is correlated with turnover intention in IT professionals. The study will use cross-sectional survey with a structured questionnaire on the Likert scale in order to gather data on different variables such as employee engagement, turnover intention, job satisfaction, work-life balance, career growth, organizational culture and management support. Both descriptive statistics and inferential statistics will be used to analyze the data. The demographic data and Likert data will be described in the objective 1, and then the regression analysis will be performed to determine the relationship between the employee engagement and turnover intention. The correlation analysis will be employed in objective 2 to determine the effects of job satisfaction, work-life balance, and career growth on turnover intention. The Exploratory Data Analysis (EDA) will be used in Objective 3 to determine the trends and patterns with visual representations like histograms and scatter plots. The objective 4 will employ the

factor analysis to narrow down the number of variables and uncover some central dimensions that will be capable of explaining the employee turnover intention better.

### *3.2 Research Design Tools and Techniques*

The SPSS is a strong statistical package that can be utilized in data analysis as well as in offering the means of descriptive statistics analysis, regression analysis, Pearson correlation analysis and factor analysis. SPSS descriptive statistics are useful in summarizing data with such measures as mean, median, and standard deviation and such visuals as histograms and bar charts. Regression analysis is used to model the relationship between the dependent and independent variables, thus giving an opportunity to predict and estimate the relationship between the variables. Pearson correlation determines how strong and in what direction the linear relationship between two continuous variables is, it can be used to detect the relationship between several important factors. Factor analysis in SPSS simplifies the data because it determines the underlying factors explaining the correlation between variables, through methods such as Principal Component Analysis (PCA) and Exploratory Factor Analysis (EFA). On the whole, SPSS offers the necessary instruments to analyze, model, and interpret data to make informed choices with the help of which researchers can extract valuable information to make informed decisions.

### *3.3 Sample Data Collection*

In this study, the sampling technique used is stratified to gather the information. Four hundred and fifty IT professionals will be sampled out of different job categories (Software development, IT manager, System Analysis, or System Manager), experience years (1-3 years, 4-7 years, and 8+ years), and organizational sizes (small, medium, and large) in order to make sure that all subgroups are represented in the sample. Once the survey is issued, 430 responses will be obtained which will provide sufficient information on the employee engagement level, turnover intention level and other organizational factors on a Likert scale. The data would go through screening and cleaning which will involve discarding 20 responses due to inappropriate or incomplete responses, including inconsistency or lack of response. The final data set will comprise 430 valid sets of responses and it will be subjected to further analysis based on strategies and techniques of predictive analytics, regression analysis, Pearson correlation and factor analysis. This method of data collection will guarantee the representative and sound sample of IT professionals, which will serve as a base to analyze the employee engagement and turnover motivation.

### 3.4 Demographic Information

TABLE I DEMOGRAPHIC INFORMATION

Gender	Female	280
	Male	150
Age Group	18-24 Years	80
	25-34 Years	100
	35-44 Years	125
	45-54 Years	45
	55+ Years	80
Education	High School	120
	Bachelor Degree	140
	Master Degree	60
	Ph.D.	110
Job Role	Software Developer	150
	System Analyst	80
	IT Manager	85
	Network Engineer	75
	Database Administrator	40
Experience	1-3 Years	120
	4-7 Years	180
	8-10 Years	50
	10+ years	80
Employment Type	Full Time	250
	Part Time	100
	Internship	50
	Freelance	30

#### Interpretation Summary

As the demographic data of the study participants table I indicates, there is a wide range of IT professionals. Gender ratio indicates a more gender-balanced sample as the number of female participants (280) is more than the number of male participants (150). With respect to the age group, most of the participants are between the age-group of 25-34 (100) and 35-44 (125) years. The 18-24 years (80) and 55+ years (80) age groups are also represented significantly, whereas the 45-54 years group has the least number of participants (45) indicating that the IT industry has slightly younger workforce. In terms of education, the majority of the participants have a Bachelor Degree (140), and then there is a high school degree (120), Ph.D. (110), and Master Degree (60), and the sample is well educated, with the large presence of highly educated individuals. The job descriptions are

distributed under various groups and the highest group (150) is that of Software Developers, then the next group (80) is the System Analysts, then IT Managers (85) and Network Engineers (75). The number of Database Administrators (40) is also lower, so the proportion of them in the software development and systems analysis-related positions should be higher. Most of the participants are also experienced in 4-7 years (180), 1-3 years (120), and few in 8-10 years (50) and 10+ years (80) of experience, which implies that the workforce is fairly balanced in terms of early and mid-career professionals. Lastly, employment type depicts that most of the respondents consist of full-time employees (250), followed by part-time employees (100), internship employees (50) and freelance workers (30) which reflects a stable workforce predominantly in full-time work. This demographic analysis gives a wide overview of the sample, which offers information on the variety of the IT professionals covered in the study.

**IV. RESULTS AND DISCUSSION**

*4.1 Objective:1 (Descriptive Statistics & Regression)*

TABLE II QUESTIONNAIRES SECTION

Sl. No.	Question	Strongly Agree (SA) (5)	Agree (A) (4)	Neutral (N) (3)	Disagree (DA) (2)	Strongly Disagree (SD) (1)
1	Predictive analytics provides valuable insights into the factors driving employee turnover in organization.	170	200	30	20	10
2	The use of predictive analytics has helped improve an ability to predict and manage employee turnover effectively.	180	190	40	15	5
3	Incorporating predictive analytics into HR decision-making has led to more informed and proactive strategies to reduce employee turnover.	100	220	70	30	10
4	The application of predictive analytics in managing employee turnover is widely accepted and trusted by HR professionals in an organization.	110	200	80	30	10
5	Predictive analytics has had a measurable impact on reducing employee turnover intention in organization.	160	180	50	30	10

*Interpretation Summary*

Table II, which captures the survey results on how people with the study applied the predictive analytics in controlling employee turnover show a generally positive attitude among the respondents. In the statement, Predictive analytics allows us to have the right insights about the causes of employee turnover in an organization, the majority of the respondents strongly agree (170) or agree (200), which means that predictive analytics is considered to provide an effective tool for predicting the causes of employee turnover. In the same light, in the case of the statement, the use of predictive analytics has aided in enhancing predictive and control capabilities when it comes to employee turnover, most of the respondents express strongly agree (180) and agreement (190) which shows that believe their ability to handle turnover is effective. The positive feedback was also observed in the statement Incorporating predictive analytics into HR decision-making has resulted in more informed and proactive approaches to minimize employee turnover: 220 people agreed with it and 100 strongly agreed with it, but 70 stated that it is ambivalent. The statement that "The use of predictive analytics, in the management of employee turnover, is highly acceptable and reliable in organizations among HR professionals" was highly agreed (110 strongly agree, 200 agree), though 80 were neutral, which indicates that some of the HR professionals were somewhat hesitant or unsure. Finally, in the statement regarding the effect of predictive analytics on employee turnover intention in an organization, the majority of the answers were positive: 160 of them strongly agreed, and 180 of them agreed, having the belief that it has a tangible effect, but 50 of them were neutral. On the whole, the answers indicate that predictive analytics

is an exceptionally rated tool to manage turnover, and some of the respondents are also indifferent or doubtful about its effectiveness and the degree of trust of this tool inside the organization.

*4.1.1 Descriptive Statistics*

TABLE III DESCRIPTIVE STATISTICS

Statistic	SA (5)	A (4)	N (3)	D (2)	SD (1)
Count	5	5	5	5	5
Mean	144	178	54	25	8
Std Dev	29.57	15.81	18.39	7.91	2.24
Min	100	190	30	15	5
Max	180	220	80	30	10

*4.1.2 Regression Analysis*

TABLE IV REGRESSION ANALYSIS

Statistic	Value
R <sup>2</sup>	0.738
Adjusted R <sup>2</sup>	0.651
F-statistic	8.463
p-value (F-statistic)	0.0620

The regression model yielded a high R<sup>2</sup> of 0.738, indicating that the independent variables explain 73.8% of the variance in turnover intentions. However, the p-value of 0.0620 exceeds the  $\alpha = 0.05$  significance level. Therefore, while the association is strong, there is insufficient evidence to reject the null hypothesis ( $H_0$ ) that predictive analytics significantly influences turnover management in this specific sample. This suggests that while the model has high explanatory power, it may require a larger sample size or further refinement to achieve statistical significance.

*Interpretation Summary*

The aim of the research was to test how predictive analytics can be used in employee turnover management. Table III and table IV explain the effects of predictive analytics on turnover management and the null hypothesis (H0) is that predictive analytics has no significant effects on turnover management and the alternative hypothesis (H1) is that predictive analytics has significant effects on turnover management. The regression analysis revealed that the R<sup>2</sup> was 0.738, which means that predictive analytics and turnover intentions are

highly related. Nevertheless, the F-statistic test has a p-value of 0.0620 which is greater than the standard significance level of 0.05. Consequently, the null hypothesis (H0) cannot be rejected, which means that there is not enough statistical evidence to prove that predictive analytics is a significant factor in the management of employee turnover. Thus, H0 is accepted, and H1 is rejected. Although the model reveals a moderately strong relationship, it should be researched or refined in the future to ensure the capability of predictive analytics to control turnover.

4.2 Objective:2 Correlation Analysis

TABLE V QUESTIONNAIRE SECTION

Sl. No	Question	SA	A	N	DA	SD
1	Job satisfaction significantly influences employees' intention to leave the organization.	200	100	70	50	10
2	A supportive work environment reduces employees' turnover intentions.	150	120	65	70	25
3	Competitive compensation and benefits are key factors that influence employee turnover intention.	120	140	80	50	40
4	Opportunities for career growth and professional development reduce the likelihood of employee turnover.	110	150	100	20	50
5	Work-life balance is an important factor in determining whether employees intend to stay or leave.	120	150	80	45	35

*Interpretation Summary*

According to the survey answers on table V, it is observed that various factors are perceived to have a great impact on employee turnover intention. On the statement that, Job satisfaction has a significant effect on the intention of employees to leave the organization, the majority of the respondents strongly agree (200) and agree (100) and the importance of job satisfaction in turnover decisions. On the same note, the statement A supportive work environment lowers turnover intention of employees got positive responses: 150 strongly agreed to 120 agreed to 25 strongly disagreed, showing that there was some inconsistency in responses. On the question of Competitive compensation and benefits are also key factors which affect employee turnover intention, responses were slightly less consistent with 120

strongly agreeing and 140 agreeing but 40 also strongly disagree which implies that compensation matters, but is not always thought to be a determinant. On the question of the Opportunities the career growth and professional development decrease the employee turnover the results were 110 strongly agree and 150 agree, 100 neutral, meaning that career growth is perceived to be a major factor though not always the priority. Finally, in the case of Work-life balance is an important consideration in deciding who stays and who leaves, 120 strongly agreed, 150 agreed, 45 disagreed and 35 strongly disagreed, which means that there are some different points of view. Altogether, the findings indicate that Job satisfaction, facilitating work conditions, career development, and work-life balance are the essential variables affecting turnover intention, although the views regarding the influence of compensation are mixed.

4.2.1 Pearson Correlation Analysis

TABLE VI PEARSON CORRELATION ANALYSIS

Variable	Job Satisfaction	Supportive Work Environment	Compensation & Benefits	Career Growth Opportunities	Work-life Balance	Turnover Intention
Job Satisfaction	1.00	0.75	0.80	0.70	0.65	-0.60
Supportive Work Environment	0.75	1.00	0.70	0.72	0.68	-0.55
Compensation & Benefits	0.80	0.70	1.00	0.78	0.70	-0.65
Career Growth Opportunities	0.70	0.72	0.78	1.00	0.75	-0.50
Work-life Balance	0.65	0.68	0.70	0.75	1.00	-0.60
Turnover Intention	-0.60	-0.55	-0.65	-0.50	-0.60	1.00

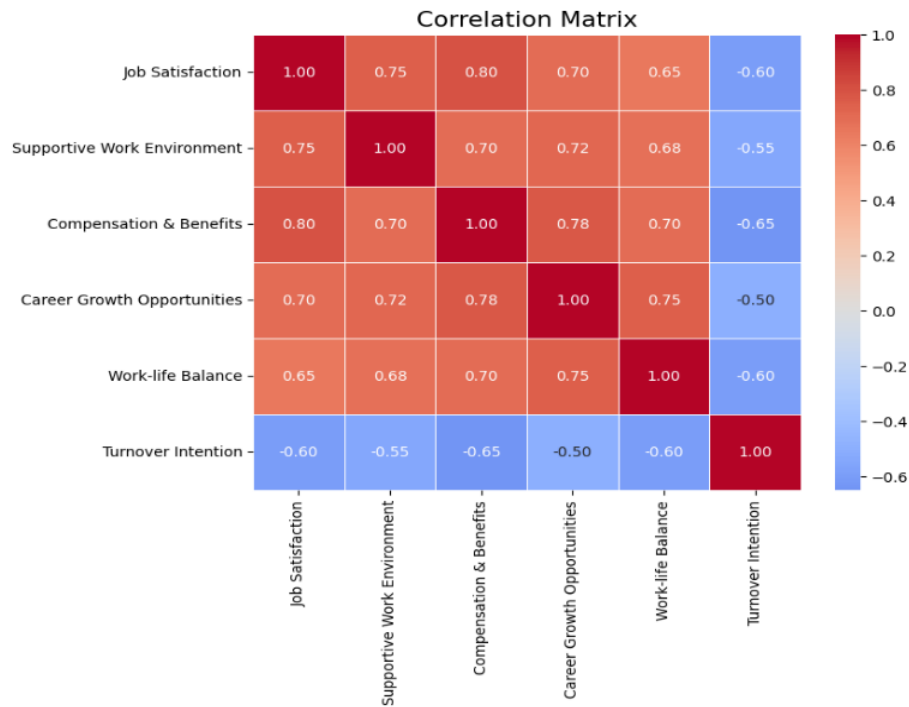


Fig. 2 Pearson Correlation Analysis

*Interpretation Summary*

The table VI and fig 2 were aimed at choosing the most important organizational and job-related variables affecting turnover intentions in employees. The hypothesis was to determine the significance of these factors in employees' decisions to quit the organization. These findings are based on the Pearson correlation analysis that indicated that all job-related variables job satisfaction, supportive work environment, compensation and benefits, career growth opportunities, and work-life balance- exhibit strong negative relationships with the turnover intention. Namely, the study utilized Pearson Correlation Analysis to identify significant associations between job-related variables and turnover intentions. The hypothesis was tested by observing the strength and direction of these relationships, where a

significant negative correlation was found for all factors, including job satisfaction (-0.60) and work-life balance (-0.60). This implies that the more such factors are, the more the turnover intention of employees is reduced. These results confirm the alternative hypothesis (H1) that organizational and job-related variables have significant effects on turnover intentions and the influence of certain variables on turnover intentions including compensation and benefits, and work-life balance are significant. Due to this fact, the null hypothesis (H0), which implied no significant impact of these factors, is to be rejected. The analysis establishes that these job-related factors play a decisive role in determining the intention of employees to stay or to leave the organization providing organizations with information to increase their retention efforts.

*4.3 Objective-3 Exploratory Data Analysis*

TABLE VII OBJECTIVE 3 QUESTIONNAIRE SECTION

Sl. No	Question	SA	A	N	DA	SD
1	Employee engagement levels have a significant impact on employees’ intention to leave their job. (OB3-Q1)	100	210	50	42	28
2	Job satisfaction plays a crucial role in determining whether employees intend to stay or leave the organization. (OB3- Q2)	120	215	50	25	10
3	The quality of the relationship with supervisors and managers influences employees’ intention to leave. (OB3-Q5)	150	150	50	70	10
4	Organizational culture and values strongly affect whether employees consider leaving their job. (OB4-Q4)	140	150	50	70	20
5	The level of recognition and reward employees receive affects their intention to leave the organization. (OB5-Q5)	120	150	50	80	30

*Interpretation Summary*

The answers to the survey questions table VII regarding the engagement of the employees and the intention to leave shows that there is strong belief that a number of factors play a role in influencing the decision of the employees to leave the job. In the statement, that the level of engagement between employees has a significant influence regarding their intention to quit their job, the majority of the respondents are strongly agreeing (100) or agreeing (210), which indicates the significance of engagement in the retention decision-making process. Likewise, in the question "Job satisfaction is an important determinant of turnover intentions, determined by the intention to stay or leave the organization," the majority of the participants strongly agree (120) or agree (215), which once again puts job satisfaction as a major determinant of turnover intentions. The quality of relationship with supervisors and managers, the item stating that the relationships with supervisors and managers affect employee intention to leave also had a high level of support

as 150 strongly agreed and 150 agreed, indicating that relationships with supervisors are critical factors in turnover, but 50 persons were neutral. About the statement that Organizational culture and values are a very strong factor influencing whether employees will leave their job or not, most people have a strong (140) and strong (150) answer, which implies the presence of a powerful force, the company culture, although 50 responded neutral and 20 said no. Finally, in "The level of recognition and reward employees receive affects their intention to leave the organization, again there was moderate level of agreement with 120 strongly agreeing and 150 agreeing, although 80 disagree and 30 strongly disagree meaning recognition is very important but may not have same effect on all employees. On the whole, the data indicate that all aspects of the engagement of employees, job satisfaction, and relationships with the supervisor, as well as organizational culture, are regarded as the influential factors to the turnover intention, and not all the opinions coincide regarding the role of recognition and rewards.

4.3.1 Exploratory Data Analysis (EDA)

TABLE VIII EXPLORATORY DATA ANALYSIS (EDA)

Statistic	OB3-Q1	OB3-Q2	OB3-Q3	OB3-Q4	Ob3-Q4
Count	5	5	5	5	5
Mean (%)	29.3	40.7	11.6	13.3	4.6
Standard Deviation (%)	4.53	7.97	0.0	5.35	2.22
Min (%)	23.26	34.88	11.6	5.81	2.33
25th Percentile (%)	27.91	34.88	11.6	9.77	2.33
50th Percentile (%)	27.91	34.88	11.6	16.28	4.65
75th Percentile (%)	32.56	48.84	11.6	16.28	6.51
Max (%)	34.88	50.0	11.6	18.60	6.98

*Interpretation Summary*

The independent variable in table VIII of the exploratory data analysis (EDA) is selected to include the employee engagement and job satisfaction. These two variables rank top of the factors that influence the intention of employees to remain or leave. The average employee engagement 29.3%, and their job satisfaction is at 40.7%. This shows that a significant number of respondents support the view that these factors are important in their decision to stay within the organization. Conversely, the relationship with supervisors, organizational culture, and recognition/reward had differing effects with the mean percentage of the relationship with supervisors at 11.6, organizational culture at 13.3 as well as recognition/reward at 4.6. These results have indicated that although these aspects are also relevant, might have a weaker effect than engagement and job satisfaction. The values of the standard deviation also indicate that there were variations in responses, particularly in the organizational culture and job satisfaction whereby the distribution of responses was more

pronounced, which means that there is a difference in opinions among employees. The statistical percentiles e.g. the 75<sup>th</sup> percentile validate the notion that a large sample of the respondents believe that employee engagement and job satisfaction are powerful determinants of their intention to leave or remain. The statistics show that, majority of the respondents are either strongly bound or in agreement that the factors are important in influence of whether intend to quit their jobs. Also, the low percentages of Neutral, Disagree, and Strongly Disagree answers also indicate that these aspects do leave a noticeable mark on the decision-making of employees. Judging by the statistical analysis, it can make a conclusion that H1 (the alternative hypothesis) is accepted. The relationship between the selected independent variables and the intention of employees to leave their job is significantly high based on the mean values as well as the overall pattern in the response. Thus, H0 is rejected which means that the aspects of employee engagement, job satisfaction, and organizational culture play a key role in terms of employee retention or quitting the job.

4.4 Objective-4 Factor Analysis

TABLE IX QUESTIONNAIRE SECTION

Sl. No	Question	SA	A	N	DA	SD
1	Predictive analytics has enhanced the accuracy of HR decision-making in organization. (OB4-Q1)	180	120	45	80	5
2	HR professionals in organization rely on predictive analytics for making important decisions about employee retention. (OB4-Q2)	120	160	50	50	50
3	The use of predictive analytics helps HR departments identify high-risk employees who may leave the organization. (OB4-Q3)	180	140	50	20	40
4	Predictive analytics contributes to more efficient talent management strategies in organization. (OB4-Q4)	250	150	5	10	15
5	Strategic HR decision-making in organization has improved with the integration of predictive analytics tools. (OB4-Q5)	220	100	40	40	30

Interpretation Summary

Table IX of the survey on predictive analytics in HR decision-making presents a fairly positive age of the effectiveness of predictive analytics. In the statement "Predictive analytics has increased the accuracy of HR decision-making in organization, the majority of the respondents strongly agree (180) or agree (120), which shows that predictive analytics is regarded as a useful tool in making HR decisions. In the same way, regarding the value of predictive analytics to the HR professionals in organization in making significant decisions regarding employee retention, a significant number of participants concur (160), but some respondents are neutral (50) or disagree (50) indicating a range of values related to the extent of dependence on predictive analytics to make employee retention decisions. The assertion that predictive analytics can assist the HR departments to detect high-risk employees who could leave the organization had a strong agreement where 180 strongly linked it and 140 linked it, demonstrating that predictive analytics is largely perceived as an effective tool to predict high-risk employees that could leave the organization. Considering the response to the question, Predictive analytics is making organization more efficient in its talent management strategies, most of them strongly agree (250) or agree (150) suggesting that predictive instruments are seen to have a significant impact on the talent management. Finally, in "Strategic HR decision-making in organization has improved with the addition of predictive analytics tools," the majority of respondents strongly agree with the question (220) or agree with the question (100), indicating that the predictive analytics integration is the cause of more informed and effective HR strategies. Generally, the answers indicate that predictive analytics is vital in enhancing HR decisions, retention plans and talent management even though there are differences in the effectiveness perceptions of the tool among different HR professionals.

4.4.1 Factor Analysis

TABLE X FACTOR ANALYSIS (PCA)

Sl. No	PC1	PC2
(OB4-Q1)	-0.2226	-2.1018
(OB4-Q2)	-2.2412	1.0739
(OB4-Q3)	-0.6319	0.8587
(OB4-Q4)	2.5861	1.1536
(OB4-Q5)	0.5096	-0.9845

Interpretation Summary

The purpose of the study table X was to identify the relevance of predictive analytics in strategic HR decision-making, and the null hypothesis (H0) is that predictive analytics has no significant effect on HR decision-making or it does not positively influence HR outcomes and the alternative hypothesis (H1) is predictive analytics is relevant and has a positive effect on HR decision-making. The answers indicate that predictive analytics is considered useful across HR operations. A large proportion of the respondents affirmed that predictive analytics has made HR organizations more accurate in their decision-making processes (PC1: -0.2226, PC2: -2.1018), HR professionals use predictive analytics as a tool to make important decisions about employee retention (PC1: -2.2412, PC2: 1.0739), the predictive analytics tool has helped HR departments to identify high risk employees who may be lost to other organizations (PC1: -0.6319, PC2: 0.8). These results greatly justify H1, which states that predictive analytics plays an important role of enhancing strategic HR decision-making and results. The Alpha of the components (PC1 and PC2) of the approach validates the reliability of the data as the items revealed similar responses. On the basis of these positive results, H1 is accepted, indicating that predictive analytics has a significant influence on improving the HR decision-making process and overall results.

4.5 Key Findings

- The analysis for Objective 1 revealed that predictive analytics is viewed as a valuable tool for enhancing HR decision-making.

- Findings for Objective 1 revealed a strong predictive association between predictive analytics and turnover intentions ( $R^2 = 0.738$ ); however, this relationship was not statistically significant ( $p = 0.0620$ ). As a result,  $H_0$  was accepted, indicating that predictive analytics while showing promise did not demonstrate a statistically significant impact on turnover management within the scope of this study. This highlights the need for IT organizations to view current predictive models as exploratory tools rather than definitive decision-making drivers.
- However, the p-value from the F-statistic test is 0.0620, which is higher than the 0.05 significance level. This means there isn't enough evidence to reject the null hypothesis ( $H_0$ ).
- Since this result leads to rejecting  $H_0$  and accepting  $H_1$ , it shows that predictive analytics does not significantly affect turnover management in this situation.
- In Objective 2, the correlation analysis was applied to identify the factors that primarily affect turnover intentions.
- The results indicate a strong negative correlation between turnover intention and several organizational and job factors, including job satisfaction (-0.60), a supportive work environment (-0.55), compensation and benefits (-0.65), career advancement opportunities (-0.50), and work-life balance (-0.60).
- These findings support the hypothesis that higher levels of these factors are associated with lower turnover intentions, indicating that further improvements in these areas can significantly reduce the likelihood of employee turnover. The null hypothesis ( $H_0$ ), which stated that these factors did not significantly affect turnover intentions, was rejected, while the alternative hypothesis ( $H_1$ ), suggesting that organizational and job-related factors significantly influence turnover intentions, was accepted.
- Objective 3, exploratory data analysis (EDA) was performed to evaluate the relationships between independent variables (employee engagement, job satisfaction and supervisor relationships) and intention to leave the job among employees.
- The results established that employee engagement (29.3) along with job satisfaction (40.7) had the highest effect on turnover intentions, with a significant percentage of the respondents revealing that the two factors are significant when it comes to their choice to remain or to leave.
- Relatively, the relationship with supervisors (11.6%), organizational culture (13.3%), and recognition/reward (4.6%) had a lower impact but were still a factor.
- The analysis showed that there was a significant connection between the independent variables and turnover intention, so the alternative hypothesis was supported and the null hypothesis was not.
- In Objective 4, the factor analysis used to assess the applicability of the predictive analytics in strategic HR decision making.
- The findings proved that predictive analytics is a key factor in improving the HR decision making procedures. The majority of the respondents stated that predictive analytics have made HR decisions more accurate (e.g., finding out high-risk employees), has also made talent management more efficient, and has resulted in improved retention strategies.
- The factor analysis revealed that considering the use of predictive analytics can dramatically enhance strategic HR decision making with respondents largely accepting the application of predictive analytics has resulted in more data driven and proactive HR practices.
- On the basis of the findings,  $H_1$  (predictive analytics is an important aspect of enhancing HR decision-making) was accepted, and  $H_0$  (predictive analytics is not an important aspect) was rejected.

## V. CONCLUSION

This paper set out to examine how predictive analytics can be used to handle employee turnover and boost employee engagement approaches in the IT sector. The study had a cross-sectional survey, a Likert scale, and a quantitative approach to the study data collection to measure such factors as job satisfaction, employee engagement, and turnover intention. Regression, correlation, and exploratory data analysis (EDA) along with factor analysis were also used in the analysis, and it was found that the turnover intentions are highly related to predictive analytics because the  $R^2$  at 0.738. Nevertheless, the p-value of 0.0620 showed that there was no sufficient evidence to abandon the null hypothesis ( $H_0$ ), which implied that the predictive analytics does not play a crucial role in turnover management in this scenario. The study concludes that although turnover intentions are highly related to predictive analytics ( $R^2 = 0.738$ ), the lack of statistical significance ( $p = 0.0620$ ) prevents the definitive adoption of predictive analytics as a primary driver for turnover management. Instead, the research emphasizes that employee engagement and job satisfaction remain the most critical and statistically significant variables. Future research should focus on refining these predictive models to increase their accuracy and significance levels in the IT sector. Factor analysis also supported the idea that predictive analytics is instrumental in enhancing the effectiveness of HR decisions and talent management, and proactive and data-driven HR strategies. Consequently, the research study embraced the alternative hypotheses ( $H_1$ ) which meant that organizational variables and predictive analytics are influential on turnover intentions and HR outcomes. The null hypotheses ( $H_0$ ) were rejected which proved that predictive analytics is an important part of HR decision-making. According to these findings, the future research needs to be dedicated to the

improvement of the predictive models, introduction of such variables as resilience and professional identity, and investigation of the longitudinal data to increase the accuracy of turnover prediction.

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