

Slide Show Presentation

PREDICTING ATTRITION

*a driver for creating Value, realizing
Strategy and refining key HR Processes*

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In a knowledge driven economy, people or human capital are emerging as the key competitive differentiator in today's "war for talent".

- Strategically managed attrition is good
- Losing skilled, knowledgeable and trained employees severely impacts a company's productivity, innovation, performance and shareholder value
- Understanding the drivers of attrition are crucial to address underlying organizational issues and develop remediating strategies.



PROBLEM STATEMENT

The aim of this study is to provide a framework for maximizing a retention strategy's ROI by leveraging insights derived from predicting attrition to prioritizing retention investments.

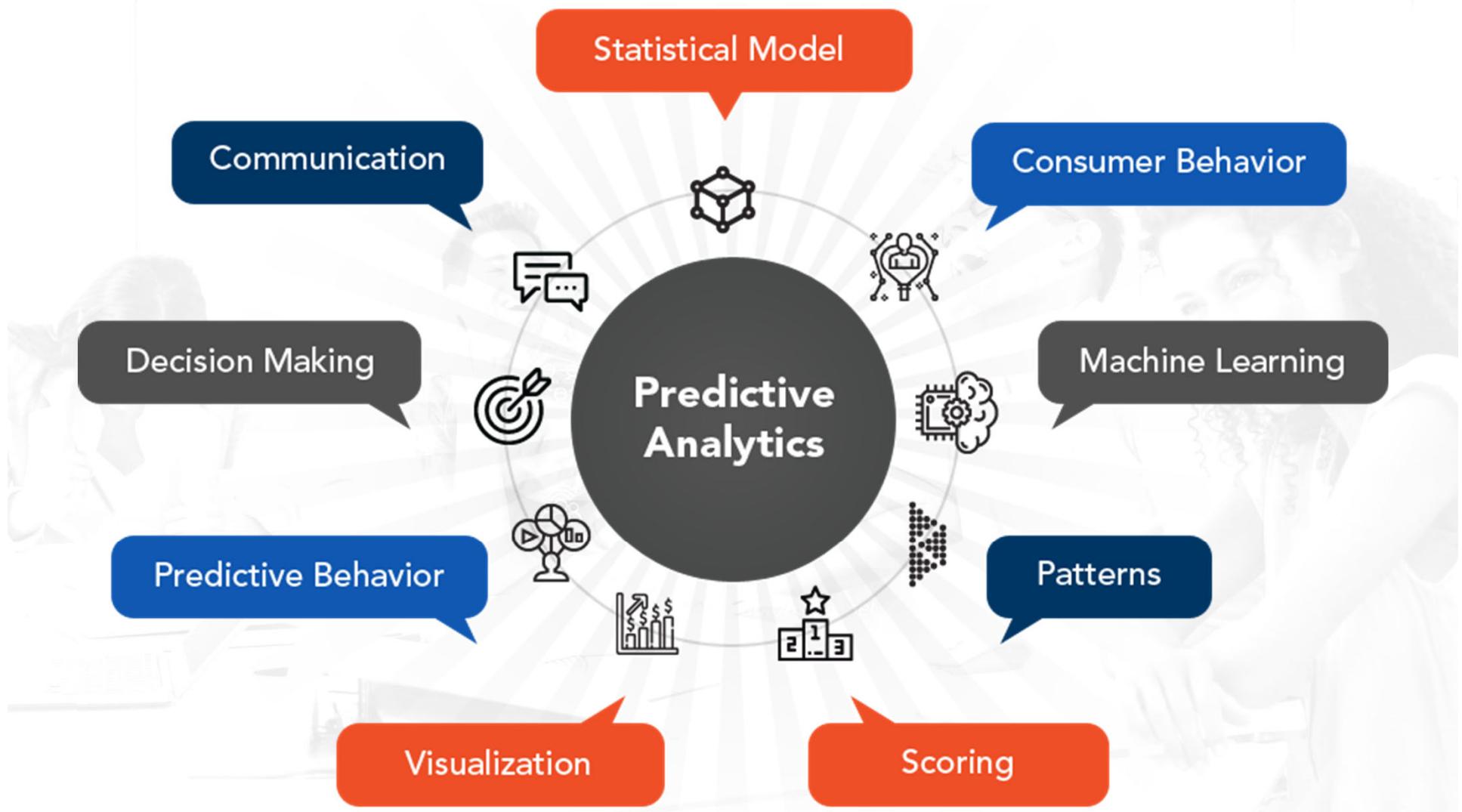
Objective 1:

- Identify which employees are at risk of leaving and determine the key factors that drive their decision.

Objective 2:

- Use the results generated from the predictive model to maximize retention investment value by strategically managing attrition and optimizing costs.

MODEL APPROACHES & EVALUATION



- **Data pre-processing:** Data Imputation, one hot encoding, Scaling, Checking for correlation, Up-sampling (SMOTE)
- **Feature Reduction:** Feature ranking with recursive feature elimination and cross-validated selection of the best number of features
- **Model Techniques:** Logistic Regression, SVM, Naïve Bayes, KNN, Decision Tree and Random Forests, Ensemble Models (Vecstack, StackingCVClassifier, StackingClassifier, VotingClassifier)
- **Parameter Selection:** Randomized search on hyper parameters – RandomizedSearchCV.

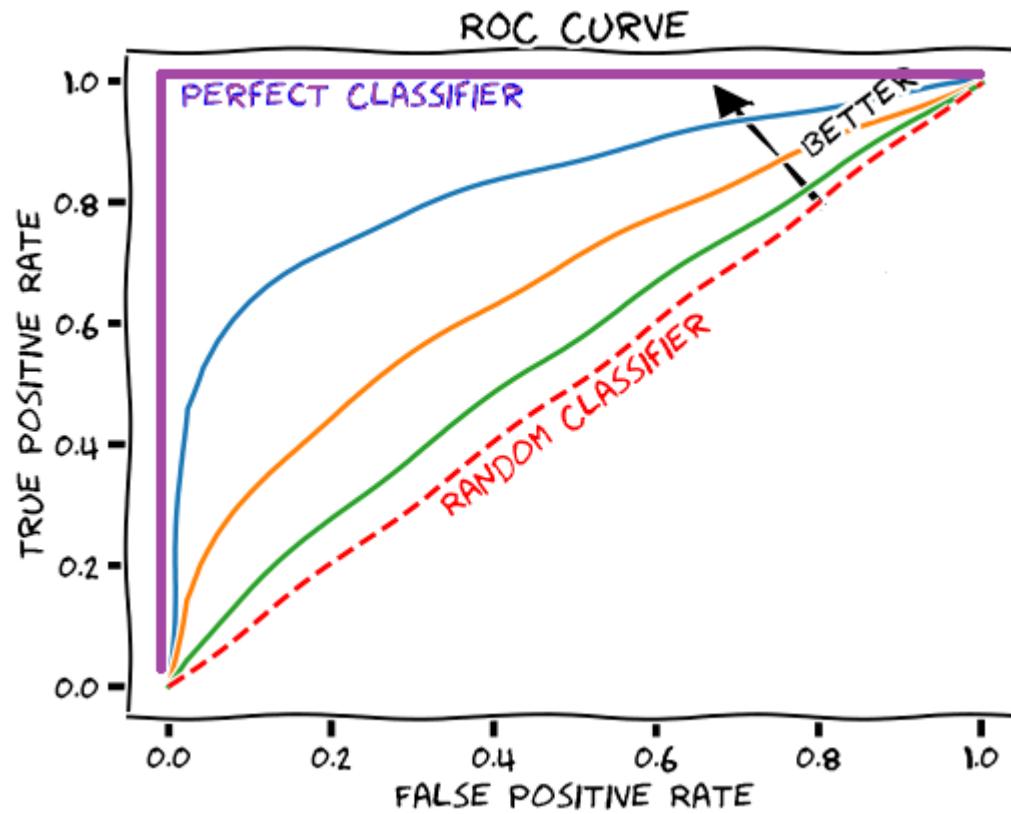


MODEL EFFECTIVENESS: INFERENCE

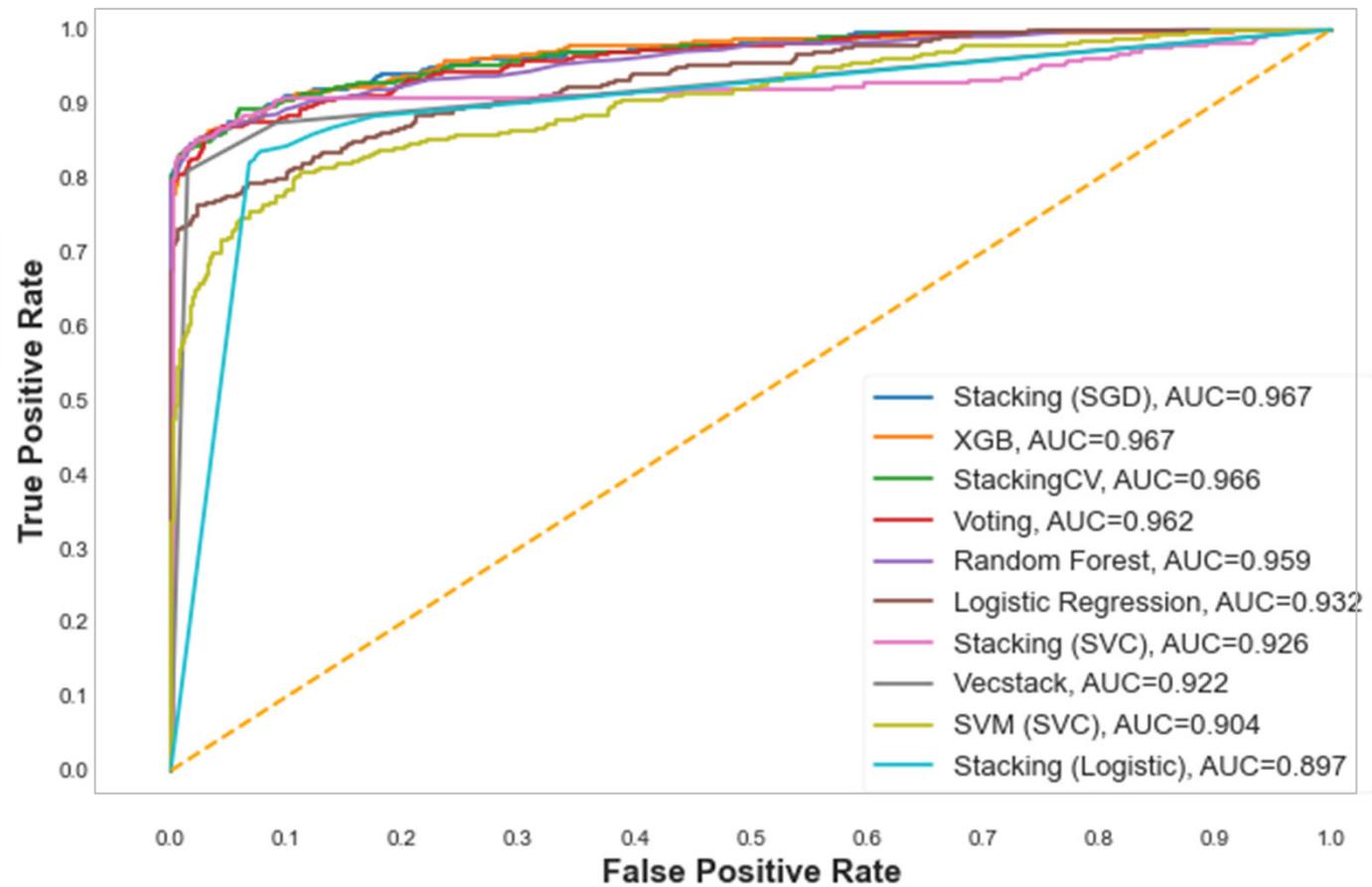
Classifier	Accuracy	Recall	Precision	AUC Score
Stacking (SGD)	0.929	0.868	0.913	0.967
XGB	0.929	0.868	0.915	0.967
StackingCV	0.923	0.863	0.9	0.966
Voting	0.932	0.857	0.932	0.962
Random Forest	0.935	0.83	0.969	0.959
Logistic Regression	0.866	0.798	0.798	0.932
Stacking (SVC)	0.927	0.854	0.92	0.926
Vecstack	0.898	0.874	0.826	0.922
SVM (SVC)	0.861	0.78	0.796	0.904
Stacking (Logistic)	0.894	0.836	0.842	0.897
Bernoulli Naive-Bayes	0.815	0.791	0.694	0.889
Decision Tree	0.883	0.868	0.798	0.879
Gaussian Naïve-Bayes	0.524	0.982	0.409	0.655

- Gaussian Naïve Bayes had the least false negatives but had a bad accuracy and precision scores.
- The Ensemble models performed better than the independent models.
- Performance of Random Forest and XGBoost models were comparable to the Ensemble models.

AUC SCORE

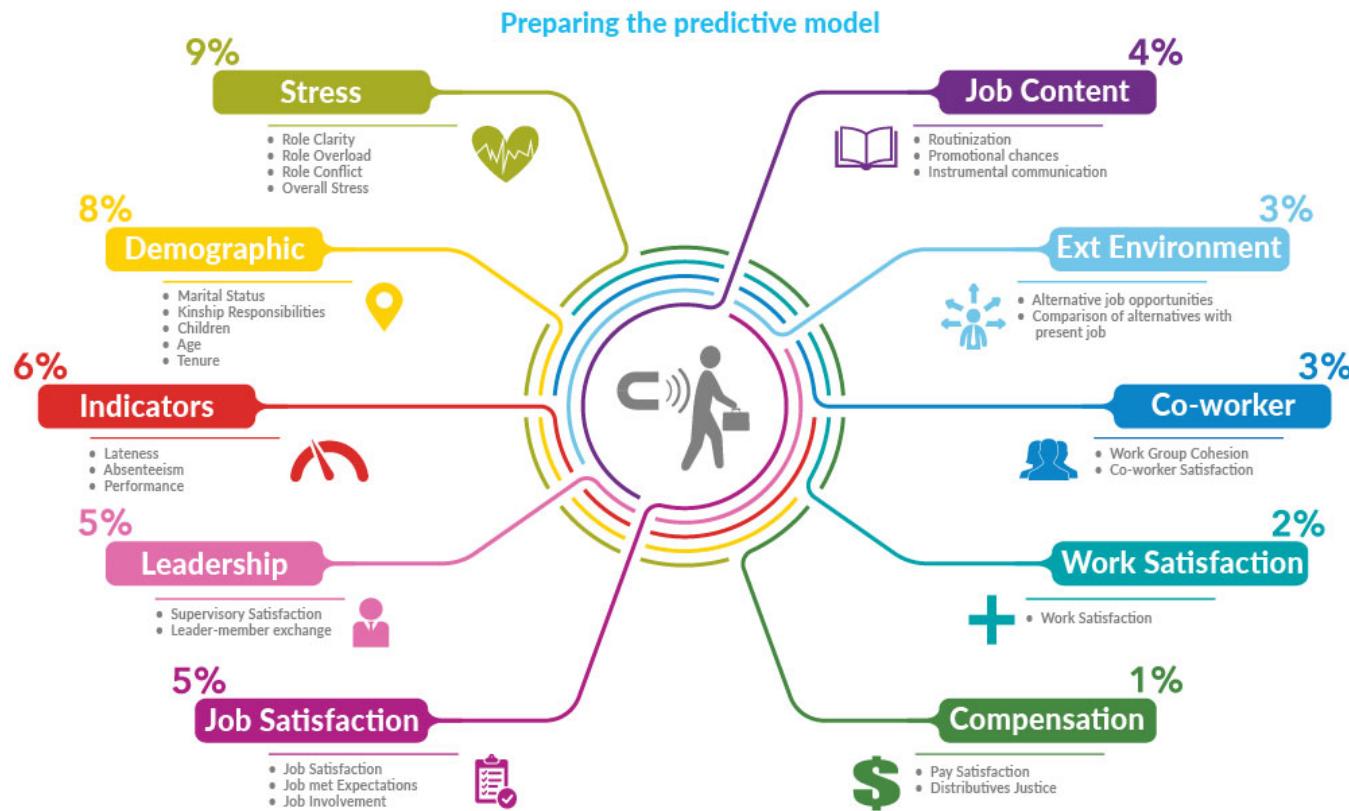


Top-5 models had an AUC score greater than 0.95

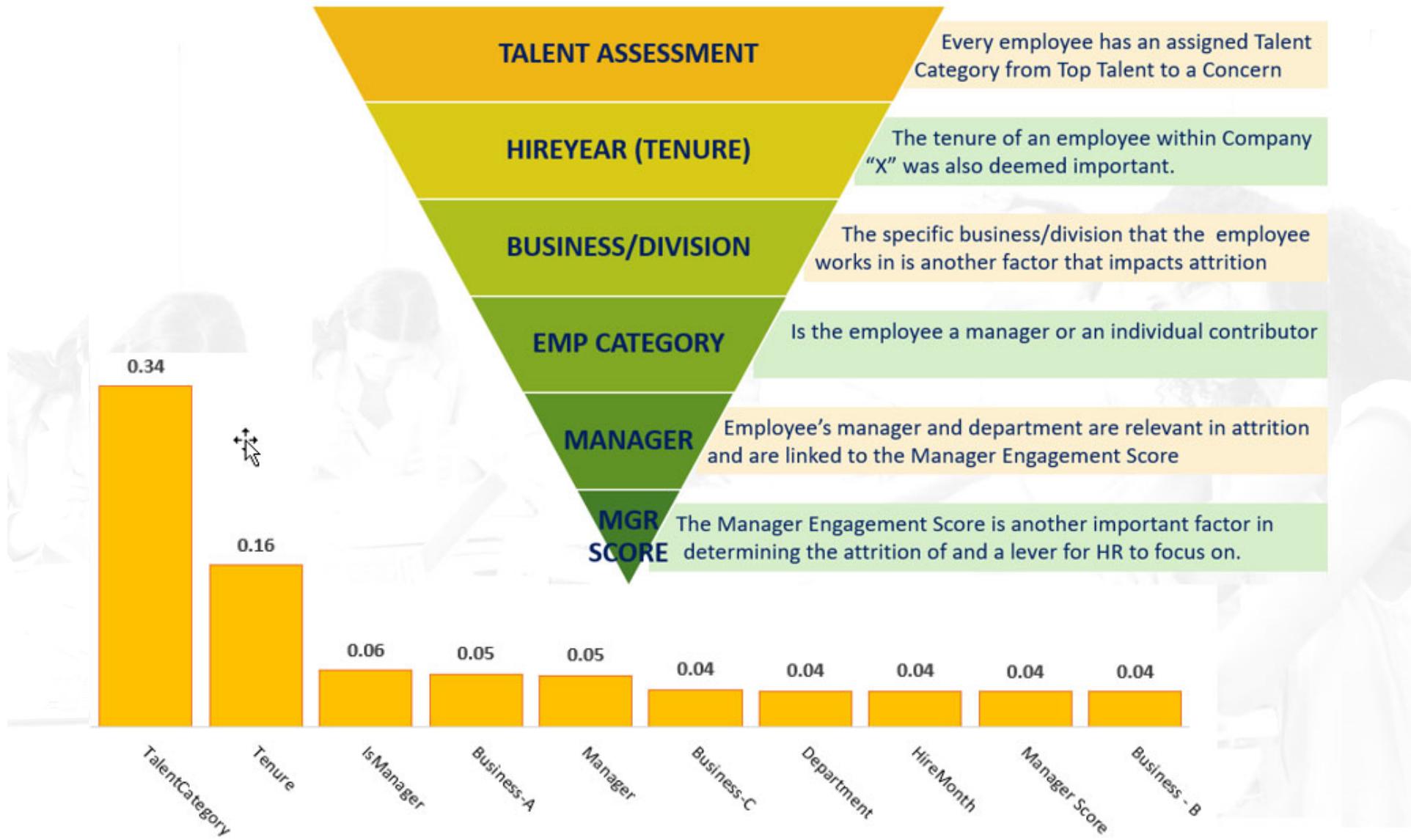


FEATURE IMPORTANCE

DRIVERS OF EMPLOYEE TURNOVER



MANAGING WHAT MATTERS MOST!!!





CONCLUSION

Maximize retention strategy's ROI by leveraging insights derived from predicting attrition and prioritizing retention investments

ASSUMPTIONS	
Employee Population	3500
Annual Attrition	12%
Avg. Annual Salary	\$68K
Replacement Cost factor	2.5
Typical Time to Fill	75 days

- Using conservative assumptions for Company X
- Current attrition @ 12% is approximately 420 terms
- Based on model accuracy of 92% the Retention ROI for **Company X is 55% returns.**

ATTRITION: 420		Model Based	Compensation	Replacement Costs	Retention Costs	ROI
Model Accuracy	92%	386	\$26M	\$66M	-	55%
Retention	70%	270	\$18M	\$46M	\$10M	
Replacement	30%	116	\$8M	\$20M	\$20M	

- Company X can develop talent pipelines for expected departures further reducing the **Time to Fill** and subsequently the **Cost of Hire** resulting in additional savings.
- The combined savings and ROI enables Company X to “**Top Grade**” backfilled roles and bring higher skilled talent into the firm to augment its top talent pool.



Q & A





THANK YOU

