Retention Risk &
Employee Turnover Strategy

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Overview

The Walt Disney Company (Disney) is synonymous with quality entertainment, innovation and the highest levels of customer service. Founded in 1923, by the creative genius, Walt Disney, the mission has gone global, but remains focused on the story.

"The mission of The Walt Disney Company is to entertain, inform and inspire people around the globe through the power of unparalleled storytelling, reflecting the iconic brands, creative minds and innovative technologies that make ours the world's premier entertainment company."[1]

Disney has grown into a multinational, multimedia and entertainment conglomerate. Disney has four business segments: Media Networks, Parks Experiences and Products, Studio Entertainment, and Direct-To-Consumer and International**.** With this incredible growth and expansion, Disney has increased the global employee population to approximately 200,000 in 48 countries. With this many employees, come the challenges of geography, cultures and evolving skills that are needed to drive the creative engines, management of intellectual property, and human capital. Human resource management and employee retention are vital to maintaining a healthy company and managing costs such as employee turnover. Voluntary turnover has become a management concern due to corporate restructuring and competition for top talent from nearby entertainment and technology companies. A 2012 report from research conducted by the Center for American Progress shows that organizations typically spend 21% of an employee's annual salary.[2] This number jumps up to 213% of an employee's annual salary for high paying jobs such as executive level positions.

The People Insights' team goals are to explore employee demographics and employee survey scores in order to predict the probability that an employee will leave the company, identify the factors that lead to increased retention (vice versa), and create a Stay Survey so that leaders/HR can use the model results to retain high risk employees.

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[1] *https://www.thewaltdisneycompany.com*

[2] *https://www.americanprogress.org/issues/economy/reports/2012/11/16/44464/there-are-significant-business-costs-to-replacing-employees/*

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Overall, this will help inform the development of a Corporate HR strategy to retain top talent, increase employee satisfaction/engagement survey scores, increase productivity, decrease voluntary turnover, and lower hiring/replacement costs, thus saving the company money. The People Insights team will use fictional data from the IBM HR Analytics Employee Attrition data set (Kaggle), which will serve as the first stage of research. This can then possibly inspire a Corporate wide study in the future, in which actual data can be used to develop a model for use in Disney Corporate with the intention of expanding across the company. A variety of modeling techniques will be attempted, including but not limited to logistic regression, random forest, gradient boosting, and clustering techniques. The team will develop interactive dashboards to share the analysis with management and make them available via mobile means.

In addition, if time allows, the team may explore Happyforce. Happyforce is a mobile feedback tool where employees can participate in a transparent and anonymous way. It allows the company to gauge the overall employee happiness and satisfaction of their employees. Combined, the employee attrition and Happyforce data may provide different dimensions such as early warning signs or opportunities to further refine HR strategy, policy, and practices. These efforts will enable Disney to retain key talent and focus on its primary creative mission ~ unparalleled storytelling to ignite the imagination for generations to come.

Business Landscape

Over the years, turnover has steadily increased. This is in part due to organizational and leadership changes, constant change, which creates uncertainty and instability. To add to this, on March 19, 2019, The Walt Disney Company acquired 20th Century Fox. With the recent acquisition, leaders and HR executives anticipate even more organizational change, which may result in the possible voluntary exits of high potential employees and quality talent that occupy key roles.

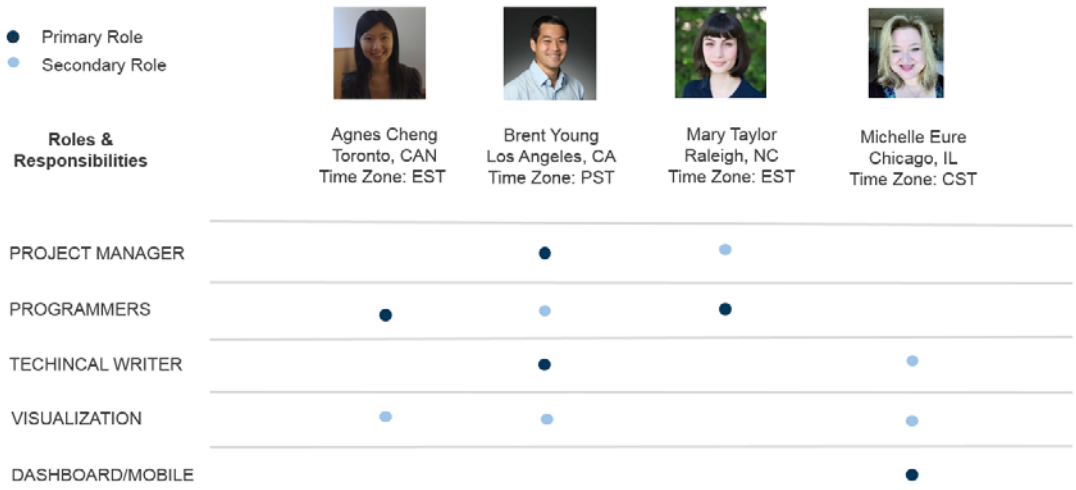
Additionally, competition for talent, specifically within Finance, Technology, and Legal continue to remain fierce from local entertainment and technology companies. This is primarily due to the fact that “content” is king and more and more companies are creating original programming and launching direct-to-consumer entertainment (e.g., SVoD service) than ever before and need the talent to support their business. Lastly, Corporate HR has received feedback from leaders within the business that they would love to see an increased use of employee data to help them make data driven decisions to solve people issues in regards to their talent.

Repercussions of High Voluntary Turnover

Here are some repercussions of high voluntary turnover:

- High replacement costs for the company.
- Projects get delayed in a time where meeting deadlines are crucial.
- Work needs to be redistributed to remaining employees, which causes worker fatigue, burnout, and employee dissatisfaction.
- New talent have to be recruited, trained and given time to acclimatize themselves to the company.
- Employee satisfaction goes down**.**
- Loss of institutional knowledge.

Meet the People Insights Team



People Insights is made up of 4 team members that each bring a diverse perspective, technical skills, skill sets, and knowledge. **Brent Young** will serve as the Project Manager & Technical Writer and has extensive experience at Disney and Workforce Analytics. In addition, to providing subject matter expertise, his primary role entails

leading the project process, meetings, and transforming complex analyses to paper in a simple and understandable way. **Mary Taylor & Agnes Cheng** will serve as our Chief Data Scientists and have a wealth of experience and technical knowledge with Python coding and data analysis. Their primary role entails building and analyzing complex predictive models using the latest machine learning techniques and technology. Last but not least, **Michelle Eure,** will serve as our Chief Dashboard/Mobile Designer and is a talented visualizer and storyboard planner. She also has a ton of experience working with C-suite executives, so she has a well-trained eye on what they seek in a final product. With that said, all of our team members have very diverse skill sets, so each team member will contribute outside their primary scope and into secondary roles throughout the project.

Business Objectives

Objective	Deliverable	Success Criteria
• Identity high, medium, and low flight risk employees.	• Exploratory data analysis of demographics, survey data, and attrition for employees. Potentially exploring cluster analysis. • Build predictive models to predict the probability that someone would leave the company.	• Decrease in voluntary turnover rate and costs. • Increase in retaining key talent. • Accurate models.
• Determine which factors prompt employees to stay vs. leave.	• Build an explainable predictive model to uncover key insights and themes.	• Changes to the work environment, policies, HR strategy, etc. • Decrease in voluntary turnover rate and costs. • Increase in employee satisfaction scores.
• Create a Stay Survey and use the model results to help retain high risk employees.	• Create questions, theoretical experiment process, and A/B testing approach.	• Shift from reactive to proactive mindset amongst leaders and HR. • Increase in retaining key talent and career conversations. • Increase in employee satisfaction scores.
• Create an interactive dashboard and mobile app for Corporate HR and leaders.	• User friendly dashboard and app that allows users to see low, medium, and high risk by team and individual along with relevant demographics.	• Usability and buy-in from CHRO, leaders, and HR.
• Explore the relationship between employee	• Build forecasting, predictive models, and clusters to	• Changes to the work environment, policies, HR

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happiness and job turnover using the Happyforce database so that HR can use the insights to develop strategies to lower employee turnover.	uncover key insights.	strategy, etc.

Note: Blue text in the table indicates key project deliverables. Grey text in table indicates project deliverables if time allows.

Modeling Approach

The People Insights team will use data from the IBM HR Analytics Employee Attrition data set (Kaggle), which contains approximately 1500 records and 35 employee, demographic, and survey related variables. The data will also be split into a training and test set. The training set will be used to fit the models and the test set will be used to estimate prediction error for model selection. The best model will then be applied to the test set for final evaluation. The models will be assessed using statistical evaluation criteria such as AUC, ROC Curves, Log loss, Decile Analysis, and will incorporate cross-validation to avoid overfitting. Additionally, given that the data set is imbalanced, we will use confusion matrix metrics such as sensitivity and specificity instead of accuracy, which can be a misleading metric when the data set is imbalanced (e.g., predicting rare events).

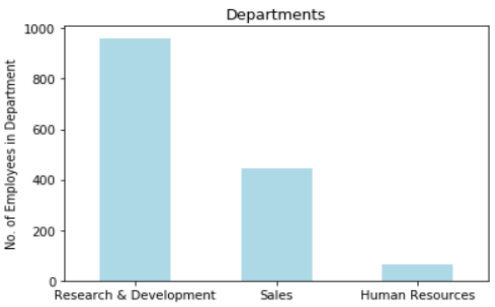
Understanding of the data will be developed through exploratory data analysis using Python. During this stage, we will analyze predictor relationships, clean the data, create new variables, transform the data, address outliers (if needed), and explore k-means clustering. Given that this a classification problem, we will experiment with a mix of explainable modeling techniques such as logistic regression and decision trees and more complex modeling techniques such as linear discriminant analysis, gradient boosting, SVM, neural networks, random forest and KNN. However, models that are interpretable, simple, and easy to explain will be preferred in situations where the statistical performance criteria is equivalent. The individual probabilities of an employee leaving the company, along with the employee data will then be merged together. A user-friendly interactive dashboard and mobile interface will then be created using Tableau, which will allow users to see a summary of low, medium, and high risk by team (e.g., R&D, Sales, HR) and individuals along with relevant demographics (e.g., position title, gender, etc.).

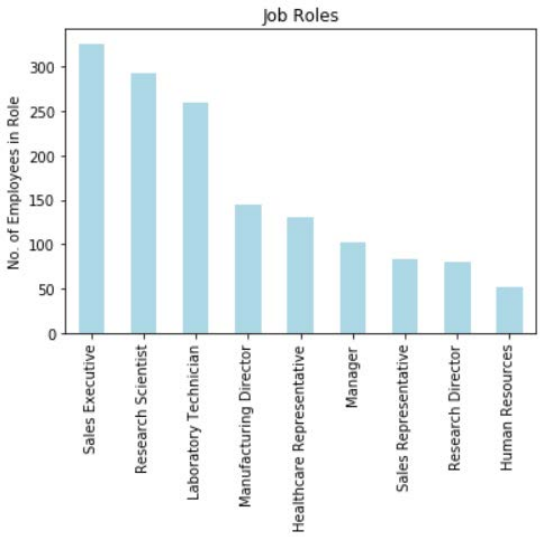
Time permitting, the team will also explore the Happyforce database. Happyforce is a feedback tool that combines a mobile app that is designed to gauge the overall employee happiness and satisfaction of employees. The database spans 2.5 years and approximately 4,500 employees of 34 companies based in Barcelona. The database contains anonymized information about the votes, comments and interactions among the different users of the application. Classification techniques, clustering, and forecasting methods may be explored.

Early Findings

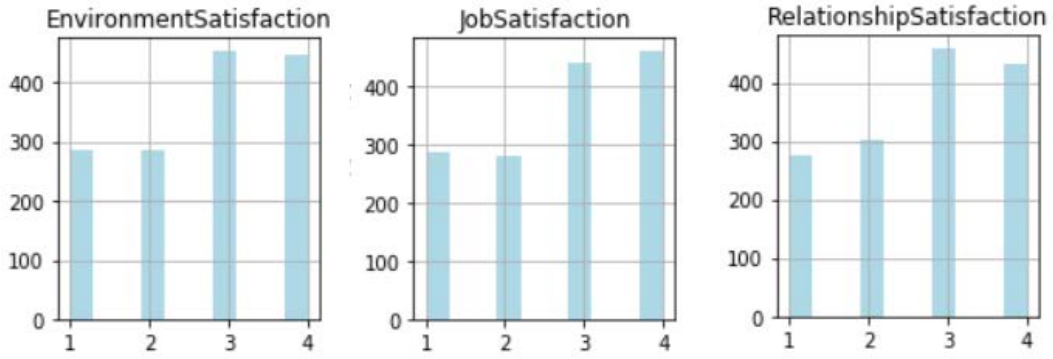
To kick start our project goals, we started with exploratory analysis of the primary employee attrition dataset to become more familiar with the type of data available to us, find initial trends, and understand the level of data cleaning necessary. Luckily the data did not contain any missing values so we can feel confident we have the necessary amount of data needed to accomplish our project goals listed above. Some initial insights are listed below:

1. Our list of employees primarily come from the Research & Development and Sales departments. Due to those specific department segments, most of our job roles are limited to positions such as Sales Executive, Research Scientist, and Laboratory Technician. With this limitation, we would need to keep in mind that applying our model to other departments or other job roles may not be as accurate. In future scenarios, if we decide to apply this model throughout all departments or additional departments, then we may need to retrain our model for accuracy.



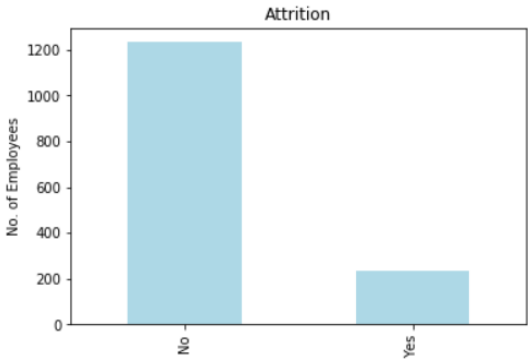


2. The survey related data asks employees three key questions about satisfaction within their Environment, their Job, and their internal Relationships (e.g., how happy is the employee with their colleagues?). Rating levels are listed as follows: 1=Low, 2=Medium, 3=High, 4=Very High



From an initial look at these satisfaction questions, it appears that they may be correlated with one another. This can be seen from the similar distributions across these ratings.

3. We also wanted to confirm if there was a healthy amount of data for both categories of attrition. Where “No” means the employee did not leave the company and “Yes” means the employee did leave the company. Reviewing this distribution shows that we may need to account for imbalanced data to successfully train our model.



Proposed Solution

We anticipate our People Insights products will allow Corporate HR and leaders to answer the following types of questions:

- What’s the probability that an employee will leave the company? Who are our low, medium, and high risk talent?
- Which factors make people stay and which prompt others to leave?

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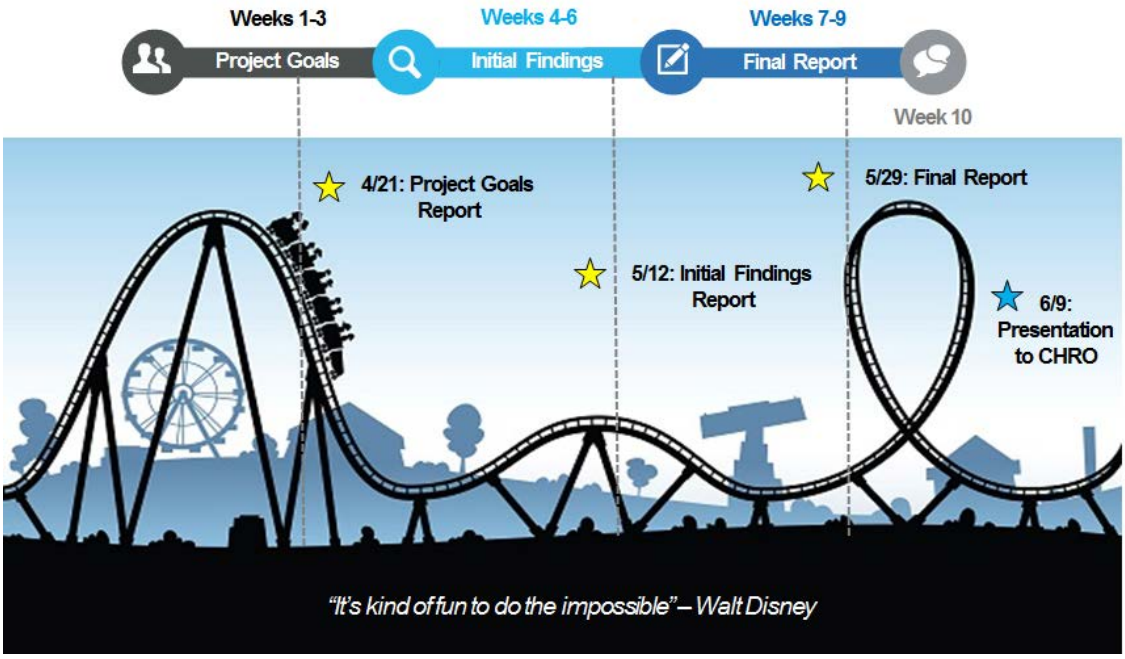
- What variables in the dataset are most predictive of people who leave the company (e.g., age, length of service, miles from home to work, etc.)?
- Given that the cost of turnover is 150% of an employee's salary, how much money could we save if there was a 10% reduction in voluntary exits per year?
- Is there a relationship between employee happiness and job turnover (time permitting)?

In addition to answering the questions above, our work will also include recommendations on:

- Probability cutoffs on what constitutes low, medium, and high risk employees
- Key demographics of high risk employees
- Changes from a work environment, culture, and employee policy standpoint
- Approach on how to implement this concept within the business

Project Plan & Timeline

Here is a summary of our 10-week project plan and timeline with key milestones identified with stars (see visual below). In addition to feedback and collaboration from the CHRO (Chief Human Resources Officer) and team members, weekly status reports will be produced for the CHRO. The purpose of these status reports is to keep the CHRO informed and bought-in throughout our project life-cycle. It will also allow us to change course quickly, if necessary.



Conclusion

Continuous change and a competitive global talent landscape are no longer the exception. The future of the Walt Disney Company rests on attracting and retaining high quality talent. People Insights is excited to contribute to the success of Disney Corporate's human capital management process through predictive models and analytic insights that drive retention of high value talent and reduce the impact and cost associated attrition. The management dashboards and interactive employee tools will keep the pulse on employee engagement. The predictive models will continue to be refined as they are deployed to the business sectors where stable talent infrastructure is needed to develop innovative, winning content and new ways to satisfy the broad base of consumers from viewing options to theme parks. It is an honor to work with the Disney team and contribute to the Disney of the future.