Predicting Employee Turnover and the

Effect on Staffing of an Organization’s Workforce

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## Overview

The purpose of this document is to ensure successful implementation of the Data Product. Given the Data Product is a Predictive Turnover model, the context of the specific business problem at hand is understanding how many people an organization needs to hire so that even as individuals leave a company, hiring goals can still be met and growth recognized. Since this Data Product includes the source code and the final Data Visualization, two plans for deployment are created. For the source code you’ll complete the following steps:

* Download Python 3.9+
* Install the following Libraries
  + Urllib
  + Pyodbc
  + Sqlalchemy
  + Numpy
  + Pandas
  + Matplotlib.pyplot
  + Itertools
  + Sklearn.metrics
  + Statsmodels.tsa.arima\_model
* Run Model
* Obtain outputs from Predictive Model
* Write those output values to your preferred Data Storage Software

For the Tableau Data Visualization, you’ll complete the following steps:

* Install Tableau and Connect to your Data Source
* Create Dashboard
* Publish Finalized Dashboard to Cloud-Based Environment
  + Tableau Server or Tableau Cloud depending on Organization
  + Tableau Public (Anyone with internet access can explore Tableau Public)

## Assumptions, Dependencies, Constraints

Deployment to Tableau can be hindered through different technical issues. In a Private Organization, the proper type of Account License, User Permissions, or more can affect successfully publishing a Visualization. Without a ‘Creator’ type account, one would not be able to publish any workbook to the cloud. The proper permissions to publish in a specific folder may be prohibited as well.

End-Users also have to have the proper license and permissions to view what has been published. Usually an ‘Explorer’ type account so data can be downloaded as an Excel workbook works the best, as well as permissions to open the folder the Dashboard has been saved on the cloud.

When utilizing Tableau Public, Dashboards are available to be seen by anyone with internet access. Because of this, sensitive information should not be published on this cloud environment. For this project Tableau Public will be utilized since there is no established Tableau Cloud based environment provided by Grand Canyon University.

## Operational Readiness

Different methods to ensure a Dashboard is ready to be published are taken before doing so. Once the visual is done, it is run through a checklist to ensure that it meets the standards of all other Dashboards that have been created. This includes a consistent design, ease of use, and clarity. A Template is used here to save time and aesthetically pre-format all design elements and functional mapping within Tableau. If needed, a video is created then to walk through how to use the Dashboard and provided to all stakeholders.

Once published on a cloud environment, the dashboard is opened from different devices and accounts to ensure that every feature works as intended across platforms. Here access issues, such as account type or user permissions, can be monitored and make sure proper support given to who needs it.

## Data Conversion

Data Conversion will follow the below chart. Most organizations will have a similar environment and process to pulling data from an HRIS and calculating a Turnover Rate from the system. This Data Product assumes that you have Turnover Rates calculated as determined by a given organization previously. Therefore this model will take your Turnover Rate and provide the finalized Forecasted values.

Diagram

Description automatically generated

## Phased Rollout

Version history is kept within Tableau to see how many different versions of a dashboard have been published. If the Dashboard is kept the same and the Data Model reconfigured, then the version of the Data Product is outputted with the final results to monitor so.

New functionality will be addressed with a tab titled ReadMe, both on GitHub for source code and within the Dashboard for Tableau features.

## Support

While a video will be made available to showcase the features of the Dashboard, email addresses will also be provided for personal outreach on the matter from Stakeholders. Any stakeholder who will rely heavily on the data from this product will be met with in person or on a virtual conference to provide a walkthrough and answer questions that may arise.

## Release Planning

Given the number of stakeholders who will utilize the data from this Data Product, information and Q&A sessions would be found beneficial. This way, as the product is being released, feedback can be received on the spot to understand if different functionality needs to be implemented to successfully answer the business question being asked.

# References

Barisic, A. F., Tomic, M., & Bach, M. P. (2022). Adoption of Human Resource Information

Systems: Impact of Industry, Size and Market. 2022 45th Jubilee International Convention on Information, Communication and Electronic Technology (MIPRO), Information, Communication and Electronic Technology (MIPRO), 2022 45th Jubilee International Convention On, 1197–1202. https://doi-org.lopes.idm.oclc.org/10.23919/MIPRO55190.2022.9803480

National Academies of Sciences, Engineering, and Medicine. (2020). Facilities Staffing

Requirements for the Veterans Health Administration—Resource Planning and Methodology for the Future. Washington, DC: The National Academies Press (NAP). <https://doi.org/10.17226/25454>

Peters, L.H., Jackofsky, E.F. and Salter, J.R. (1981), Predicting turnover: A comparison of part-

time and full-time employees*.* J. Organiz. Behav., 2: 89-98.

<https://doi.org/10.1002/job.4030020204>

Valluru, S. (2018). Turnover Analytics & Forecasting Hiring Demand: HR Domain.

International Journal of Business Insights & Transformation, 12(1), 3–5.

Lawrance, N., Petrides, G., & Guerry, M.-A. (2021). Predicting employee absenteeism for cost

effective interventions. Decision Support Systems, 147, N.PAG. <https://doi-org.lopes.idm.oclc.org/10.1016/j.dss.2021.113539>