# CAPSTONE PROJECT

## EMPLOYEES BURNOUT ANALYSIS AND PREDICTION


**Presented By:**

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# PROJECT OVERVIEW

Employee burnout is a significant issue affecting both individual well-being and organizational performance. Key contributors include excessive workloads, limited autonomy, insufficient support, and poor work-life balance. Burnout manifests as emotional exhaustion, depersonalization, and diminished personal accomplishment, leading to higher absenteeism, turnover, and reduced job satisfaction. Strategies to combat burnout include fostering a supportive culture, flexible work practices, and wellness programs, promoting healthier and more productive work environments.

# OUTLINE

- Problem Statement
- System Development Approach
- Algorithm & Deployment
- Result
- Conclusion
- Future Scope
- References

# PROBLEM STATEMENT

This project examines employee burnout through data-driven insights and predictive modeling to uncover its root causes, warning signs, and risk factors within the organization. Utilizing these findings, targeted interventions are designed to promote a healthier work culture, boost employee engagement, and reduce burnout, driving overall organizational success and sustainable growth.

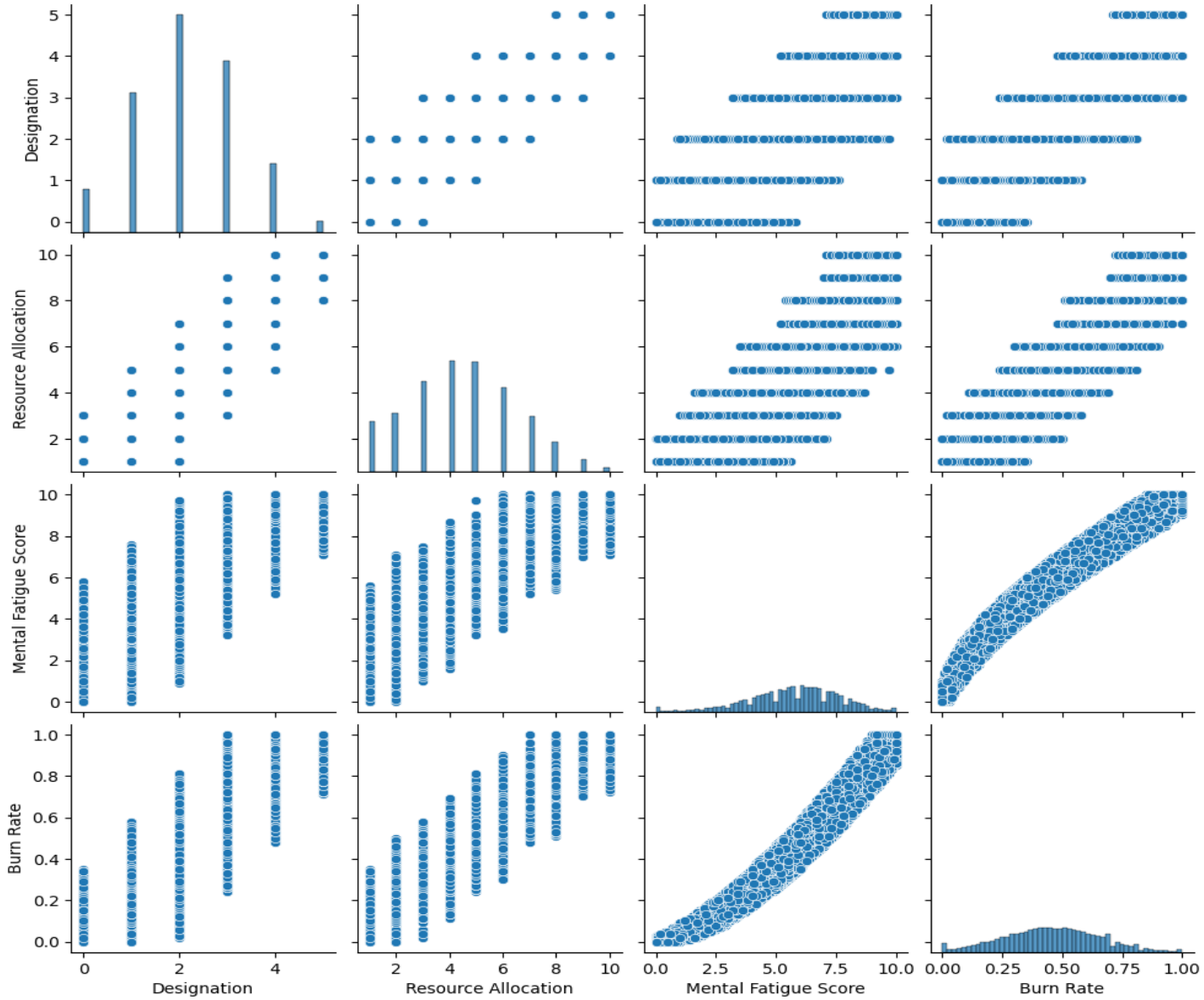
# SYSTEM APPROACH

- **System requirements**
  - **Google Colab –** It provides a cloud-based Jupyter notebook interface pre-configured with popular libraries and tools.
  - **Google Drive –** Convenient for smaller datasets and collaboration.
  - **Hardware Acceleration** - Use hardware accelerators like GPUs or TPUs, which Google Colab provides with varying availability.
- **Library required to build the model**
  - **Pandas** – It is a Python library for data manipulation, analysis, and structured data handling.
  - **Matplotlib** - A Python library for creating static, interactive, visual plots.
  - **Sklearn** - It simplifies machine learning with tools for modeling and evaluation.
  - **Seaborn** - It simplifies data visualization with beautiful, statistical graphs in Python.

# ALGORITHM & DEPLOYMENT

1. **Understand the Problem** - Predict the "Burn Rate" of employees based on factors like designation, resource allocation, and mental fatigue.
2. **Import Libraries** - Import necessary libraries: pandas, numpy, matplotlib, seaborn, sklearn.
3. **Load Dataset** - Load the dataset into a pandas DataFrame.
4. **Data Preprocessing** - Handle missing values (e.g., using fillna () or dropna ()).Encode categorical variables using Label Encoder or get_dummies ().Normalize numerical features with Standard Scaler().
5. **Exploratory Data Analysis (EDA)** - Visualize feature relationships with scatter plots and heatmaps. Check distributions and outliers with histograms.
6. **Feature Selection** - Select relevant features based on correlation or domain knowledge.
7. **Split Dataset** - Split data into training and testing sets (e.g., 80% train, 20% test) using train_test_split ().
8. **Model Training** - Train a model (e.g., Linear Regression, Random Forest).

# RESULT



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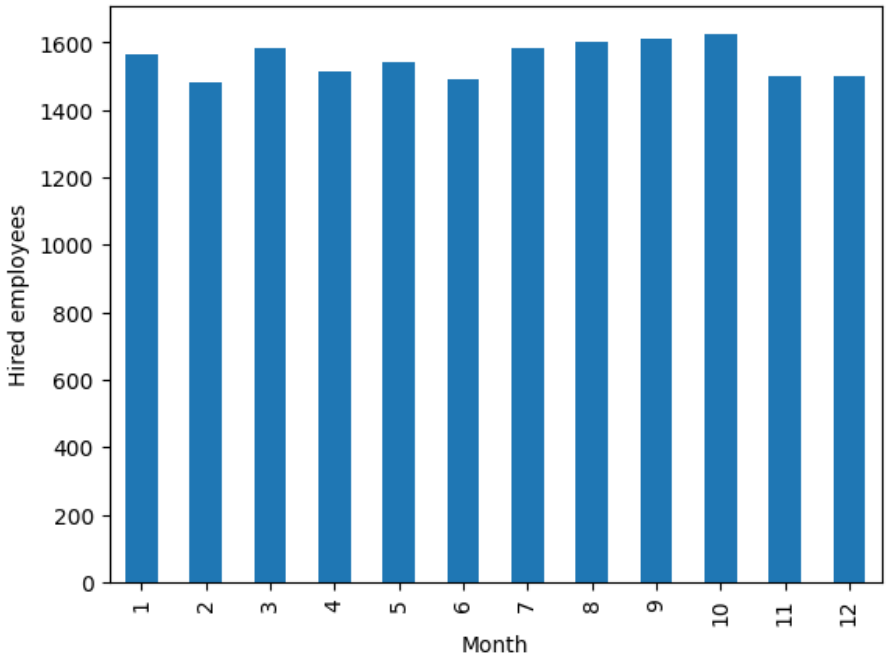


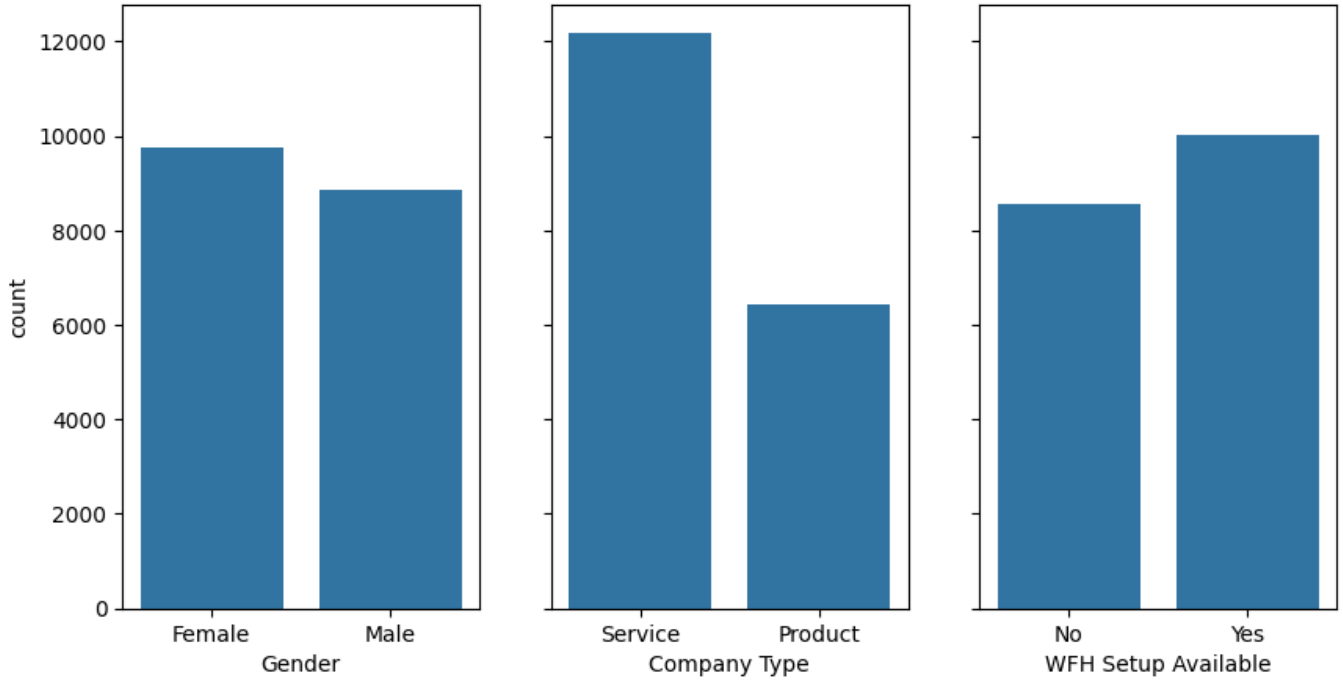

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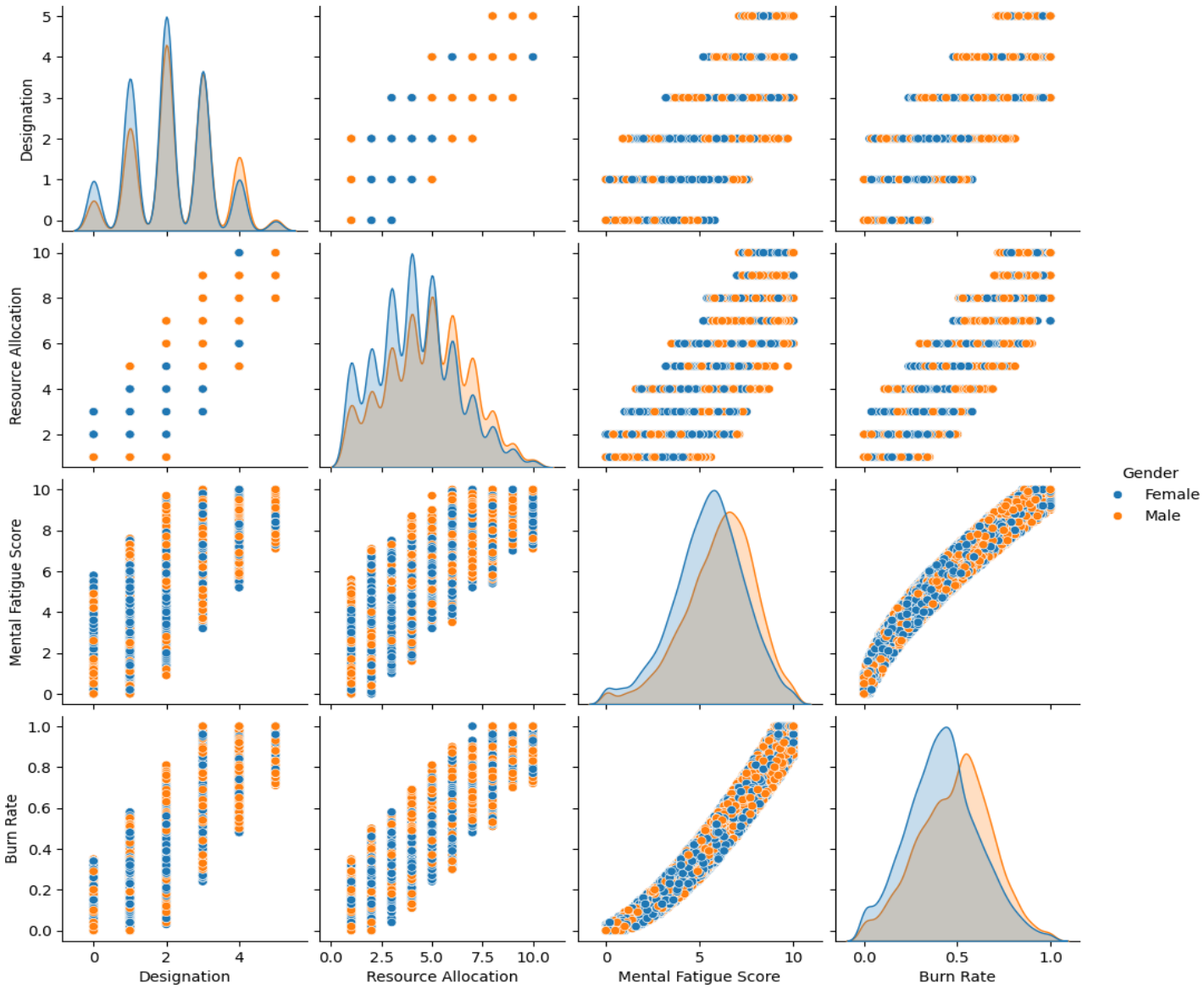

# RESULT

Linear Regression Model Performance Metrics:

Mean Squared Error: 0.0031569779113610717
Root Mean Squared Error: 0.0561869905882231
Mean Absolute Error: 0.045950320326447 73
R-squared Score: 0.918822674247248

KNN Regression Model Performance Metrics:

Mean Squared Error: 0.00338130966469428
Root Mean Squared Error: 0.05814902978291452
Mean Absolute Error: 0.04616496324188633
R-squared Score: 0.9130542931155712

Support Vector Machine (RBF Kernel) Performance Metrics

Mean Squared Error: 0.003412045741229 86
Root Mean Squared Error: 0.058412719002199
Mean Absolute Error: 0.04962241383880883
R-squared Score: 0.9122639573681112

Random Forest Regressor Performance Metrics

Mean Squared Error: 0.0033849239726708134
Root Mean Squared Error: 0.058180099455662 79
Mean Absolute Error: 0.045936520419156066
R-squared Score: 0.912961356178975 6

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# CONCLUSION

Burnout analysis reveals key risk factors within our organization, highlighting the urgent need for proactive intervention. By implementing preventive measures such as workload management, employee recognition, and stress management programs, we can create a healthier and more productive work environment. Regular monitoring and reassessment will ensure the effectiveness of our burnout prevention strategies and allow us to adapt to evolving needs.

# FUTURE SCOPE

- **Real-time monitoring** - Track burnout risk in real-time using live data.
- **HR tech integration** - Seamlessly connect burnout tools with HR systems.
- **Empower employees** - Give employees tools to manage their own burnout risk.
- **Transform workplace culture** - Create a culture that prioritizes employee well-being.
- **Focus on prevention** - Shift towards proactive well-being initiatives.
- **Global adaptation** - Adapting solutions to different cultures and work settings.
- **Ethical data use** - Ensuring responsible and fair use of employee data.

# REFERENCES


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# THANK YOU

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