

## SOLUTION ARCHITECTURE

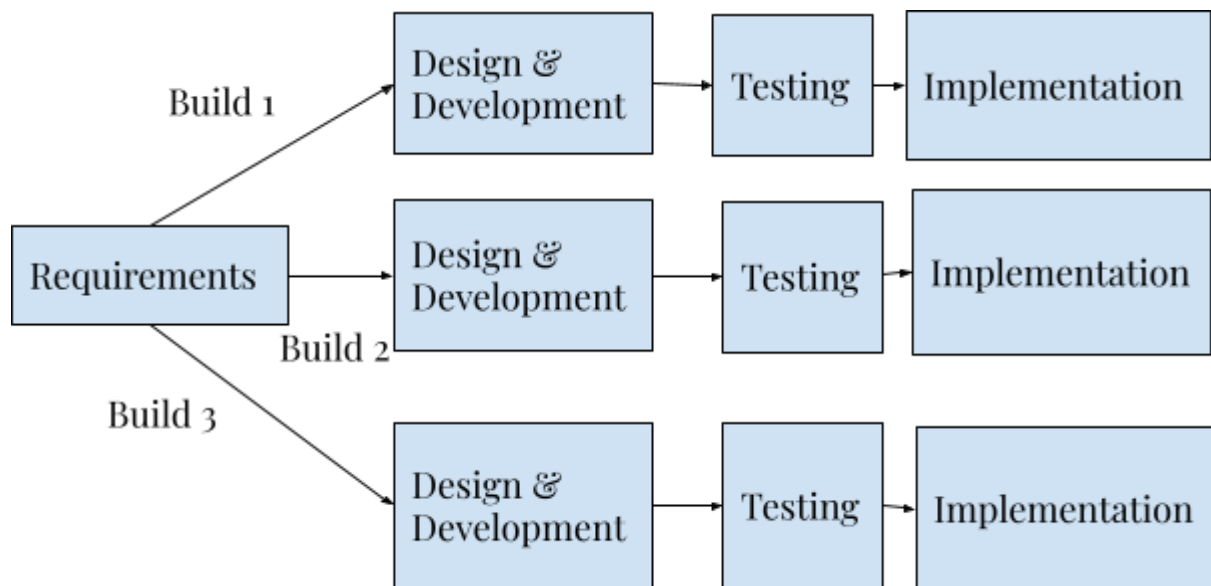
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| Date         | 26 September 2022                      |
| Team ID      | PNT2022TMID28131                       |
| Project Name | Corporate Employee Attrition Analytics |

### FUNCTIONAL REQUIREMENTS :-

The system's functional requirements are in one phase. The HR logs into the system, upload employee data and then make predictions.

- 1) Usability: The proposed system should be easy for the user to operate, enter data, and interpret the output
- 2) Compatibility: the proposed system should be compatible with all web browsers.

The requirements are not finished in the iterative model, and the iterative process begins with a minimal set of requirements. Each iteration creates a little version of the product, which is then repeated until the final version is ready. The implementation of an iterative process model begins with a subset of required specifications.



Requirements Engineering is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant and detailed.

### ARCHITECTURE FOR BUSINESS NEEDS :-

The HR registers into the system and sends requests to the database server. The database server processes the request and returns a response to the system. After

the registration process he logs into the system and sends a request to the database server. The database server validates the request and returns a response to the system. Receiving the response from the database the HR loads data to the system which in turn sends data to the server. The server processes the data and shows response to the HR via the system. Thus the predicted data is sent by the HR and requests prediction from the database server and the server returns the result.

## **STAGES OF IMPLEMENTATION :-**

### **1) Dataset Description**

Collect the employee dataset, which consists of current and past employee observations - The dataset contains target features, identified by the variable Attrition: "No" represents an employee that did not leave the company and "Yes" represents an employee that left the company. This dataset will allow the machine learning system to learn from real data rather than through explicit programming. If this training process is repeated over time and conducted on relevant samples, the predictions generated in the output will be more accurate.

### **2) Data Cleaning**

Apply various data cleaning techniques to prepare the dataset - Data preparation is one of the most important aspects of machine learning; it is usually complex and often requires a lot of time. In fact, it has been calculated that on average this operation requires 60% of the time and energy spent on a data science project.

### **3) Data Exploration**

Descriptive analysis of data to detect the key factors and trends that contribute to attrition - Once the data cleaning and data exploration phases are complete, it is necessary to proceed with Categorical Encoding before moving to the descriptive analysis. In this phase data is transformed to the correct format to perform the analysis. It is necessary to change the format of some variables to allow greater readability and a comparison with other analysed quantities, in order to avoid ambiguous results.

### **4) Descriptive Analysis**

Elaborate the dataset for the training and testing phase and try several classification algorithms to process it - Descriptive analysis is to observe the distribution of the target variable within the dataset.

### **5) Model Building & Results**

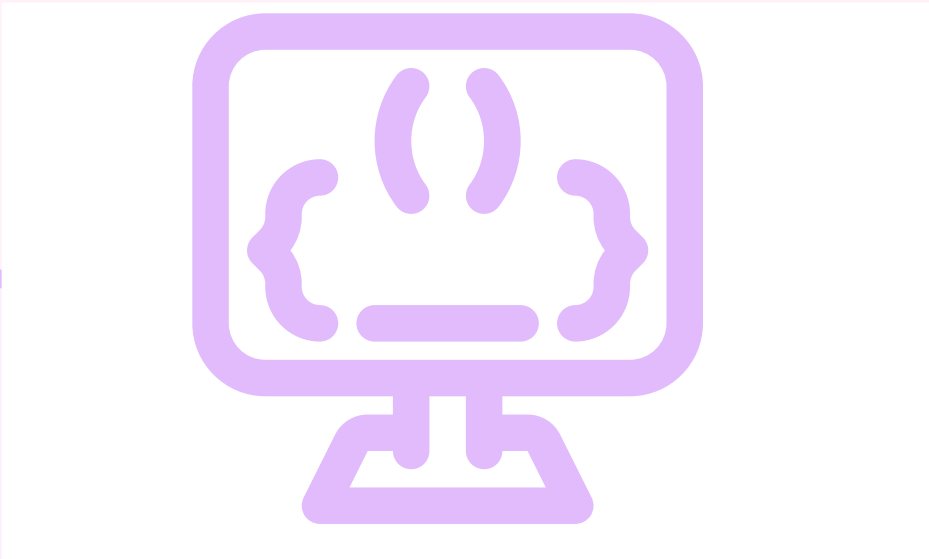
Based on the results collected with test data, compare many performance metrics of machine learning models and select which model best fits and gives the most accurate results for the given problem and release HR support software that implements the classification model.

## MINIMUM VIABLE ARCHITECTURE :-

|            |  |
|------------|--|
| Design     | <ol style="list-style-type: none"><li>1) Training Data</li><li>2) Train the algorithm</li><li>3) Model</li><li>4) Input Data</li><li>5) Processing the algorithm</li><li>6) Predictions</li><li>7) Evaluate</li></ol>  |
| Usable     | <ol style="list-style-type: none"><li>1) System should be easy for the user to operate.</li><li>2) Entering data should be easier.</li><li>3) Interpreting the output.</li><li>4) This system helps to analyse employee attrition so that they can reduce the labour costs.</li></ol>  |
| Reliable   | <ol style="list-style-type: none"><li>1) Find the root cause of the problem and predict when employees will leave and why. With this data, employers can make changes to improve attrition rates.</li><li>2) Develops and shapes drills that benefit both the management and the employees.</li><li>3) Competitive measures to enhance company brand image.</li><li>4) Enables HR managers to develop long-term strategies to reduce attrition and enhance work culture.</li></ol>   |
| Functional | <ol style="list-style-type: none"><li>1) Data preparation is one of the most important aspects of machine learning; it is usually complex and often requires a lot of time.</li><li>2) Once the data cleaning and data exploration phases are complete, it is necessary to proceed with Categorical Encoding before moving to descriptive analysis. This phase is to transform data to the correct format to perform the analysis.</li><li>3) Descriptive analysis is to observe the distribution of the target variable within the dataset.</li></ol> |

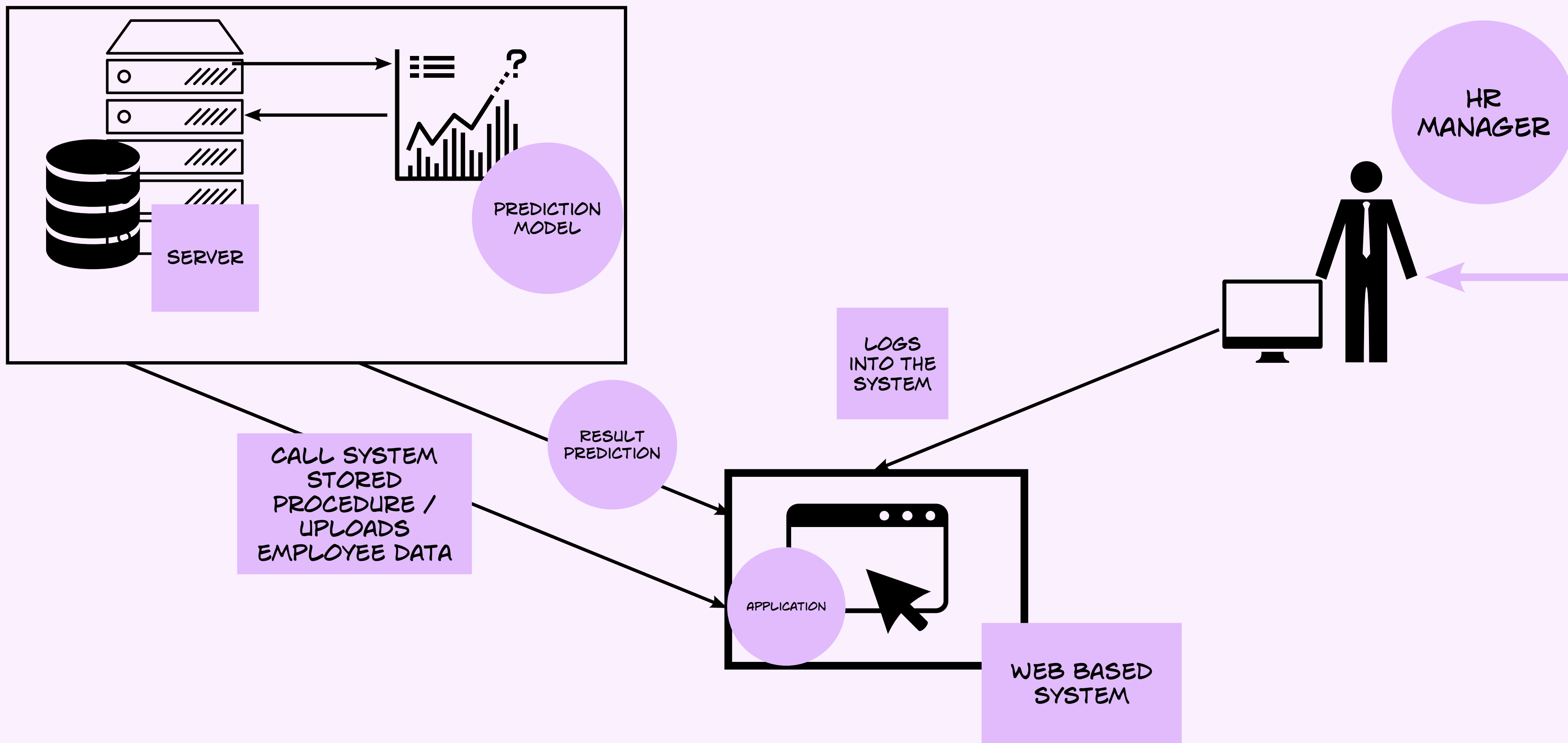


Solution Architecture for Employee Attrition

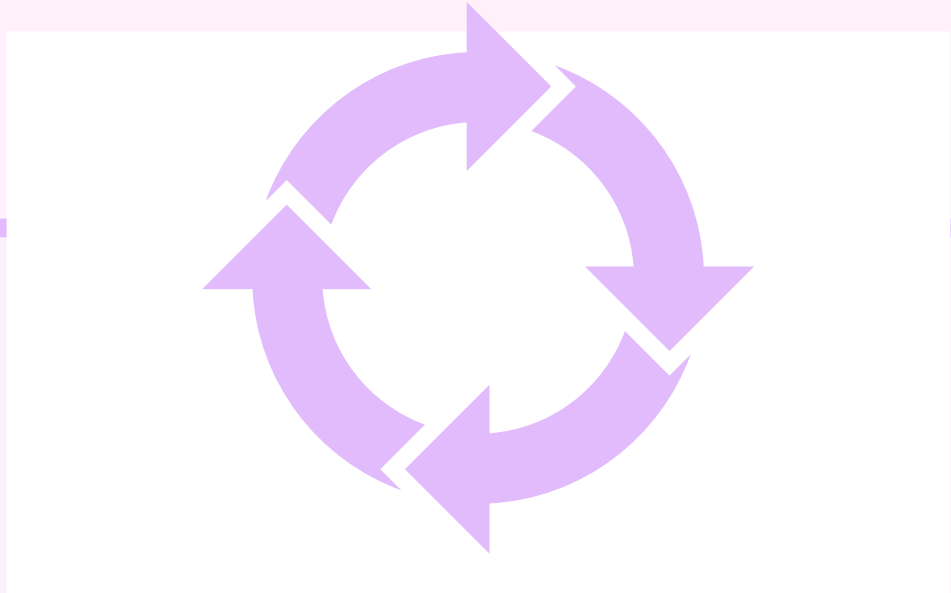


Functional Requirements

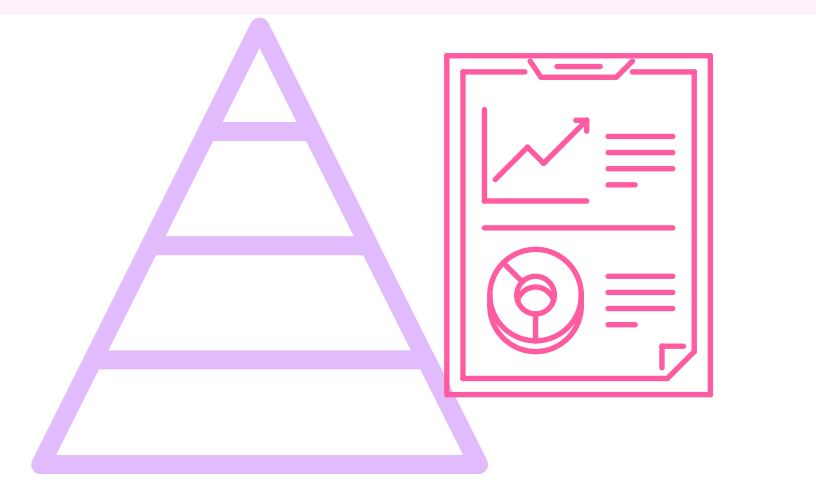
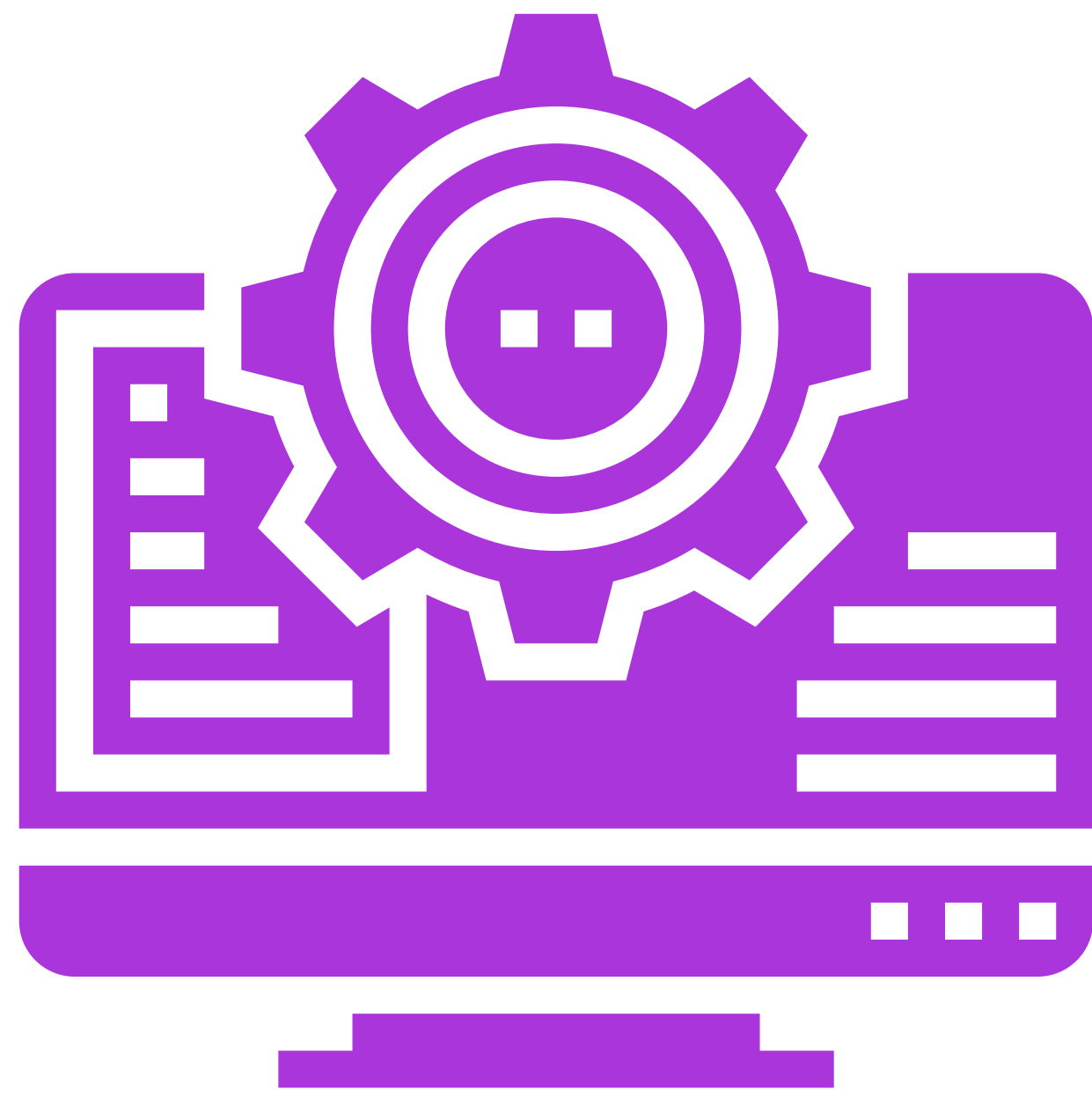
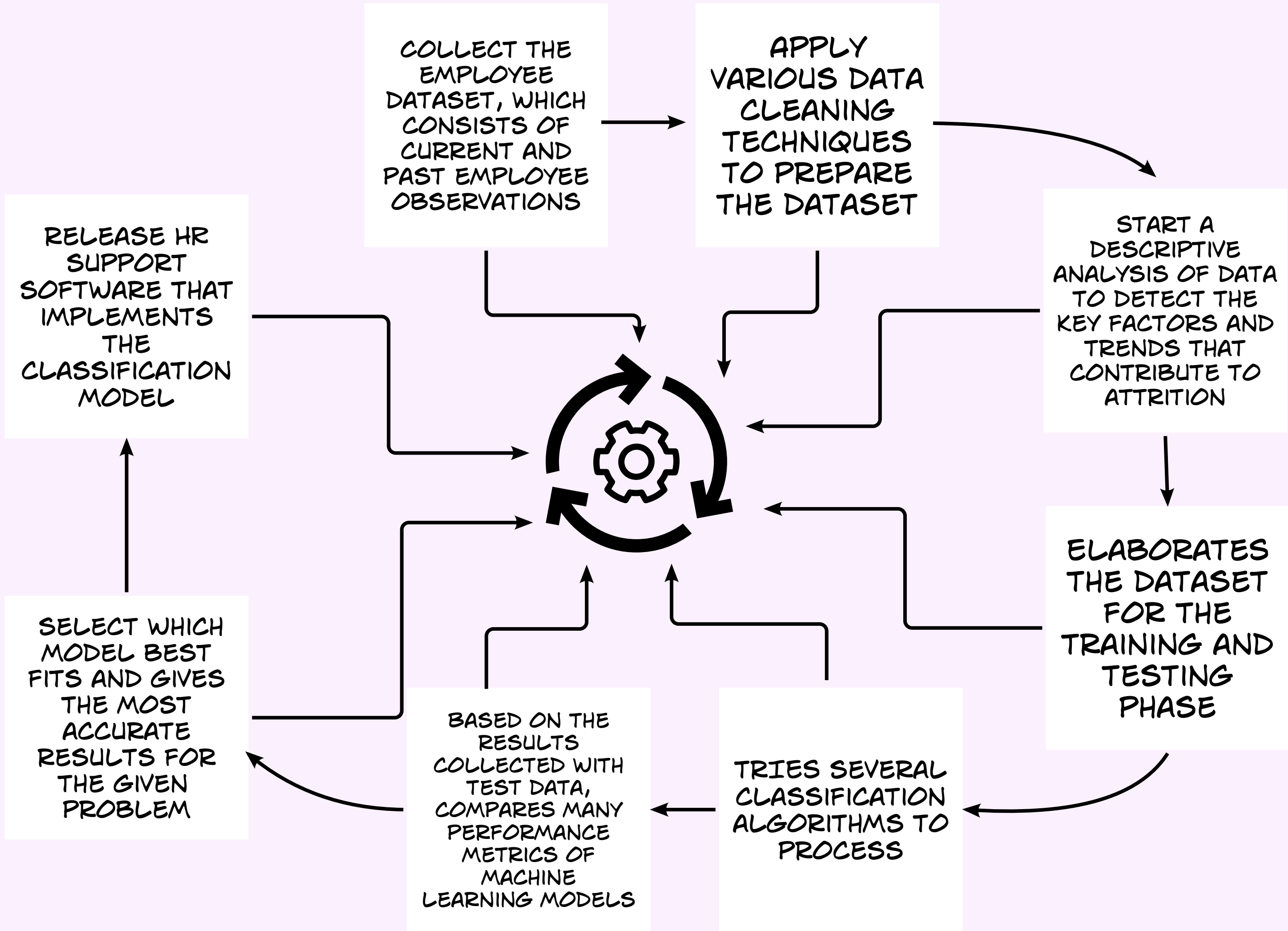
HR logs into the system, upload employee data and then make prediction.



Corporate Employee Attrition System



Stages Of Implementation



Minimum Viable Architecture

|            |   |
|------------|---|
| DESIGN     | 1) TRAINING DATA<br>2) TRAIN THE ALGORITHM<br>3) MODEL<br>4) INPUT DATA<br>5) PROCESSING THE ALGORITHM<br>6) PREDICTIONS<br>7) EVALUATE   |
| USABLE     | 1) SYSTEM SHOULD BE EASY FOR THE USER TO OPERATE.<br>2) ENTERING DATA SHOULD BE EASIER.<br>3) INTERPRETING THE OUTPUT.<br>4) THIS SYSTEM HELPS TO ANALYSIS THE EMPLOYEE ATTRITION SO THAT THEY CAN REDUCE THE LABOUR COSTS.   |
| RELIABLE   | 1) FIND THE ROOT CAUSE OF THE PROBLEM AND PREDICT WHEN EMPLOYEES WILL LEAVE AND WHY. WITH THIS DATA, EMPLOYERS CAN MAKE CHANGES TO IMPROVE ATTRITION RATES.<br>2) DEVELOPS AND SHAPES DRILLS THAT BENEFIT BOTH THE MANAGEMENT AND THE EMPLOYEES.<br>3) COMPETITIVE MEASURES TO ENHANCE COMPANY BRAND IMAGE.<br>4) ENABLES HR MANAGERS TO DEVELOP LONG-TERM STRATEGIES TO REDUCE ATTRITION AND ENHANCED WORK CULTURE.  |
| FUNCTIONAL | 1) DATA PREPARATION IS ONE OF THE MOST IMPORTANT ASPECTS OF MACHINE LEARNING; IT IS USUALLY COMPLEX AND OFTEN REQUIRES RATHER A LOT OF TIME.<br>2) ONCE THE DATA CLEANING AND DATA EXPLORATION PHASES ARE COMPLETE, IT IS NECESSARY TO PROCEED WITH CATEGORICAL ENCODING BEFORE MOVING TO THE DESCRIPTIVE ANALYSIS. THIS PHASE IS TO TRANSFORM DATA TO THE CORRECT FORMAT TO PERFORM THE ANALYSIS.<br>3) DESCRIPTIVE ANALYSIS IS TO OBSERVE THE DISTRIBUTION OF THE TARGET VARIABLE WITHIN THE DATASET. |