

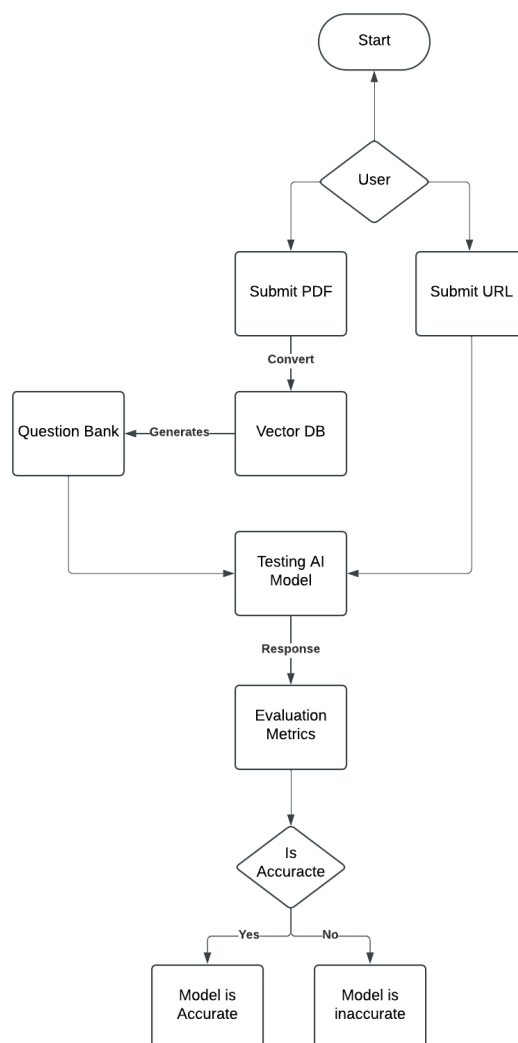
Problem Statement:

AI models often lack consistent monitoring and governance, leading to degraded accuracy, reduced reliability, and challenges in ensuring compliance with ethical and regulatory standards.

Proposed Solution:

The Model Governance Analysis framework is designed to ensure that AI models are consistently monitored, evaluated, and governed. It aims to address key challenges related to performance degradation, reliability, and ethical compliance by providing a structured approach to assess the models based on both performance and fairness metrics.

Flowchart:



Performance Metrics

These measure how well your model is performing on its intended task.

- **Accuracy:** Percentage of correct predictions (for balanced datasets).
- **Precision, Recall, and F1-Score:** Especially important for imbalanced datasets.
 - Precision: $\text{True Positive} / (\text{True Positive} + \text{False Positive})$
 - Recall: $\text{True Positive} / (\text{True Positive} + \text{False Negative})$
 - F1-Score: Harmonic mean of precision and recall.
- **ROC-AUC:** Measures the trade-off between true positive and false positive rates.
- **Log Loss:** Evaluates the uncertainty of predictions (probabilistic models)

Fairness Metrics

These measure whether your model treats different groups equitably.

- **Demographic Parity:** Ensures equal positive outcomes across demographic groups.
- **Equal Opportunity:** Checks if the true positive rate is equal across groups.
- **Disparate Impact:** Ratio of positive outcomes for one group compared to another.
- **Statistical Parity Difference:** Difference in positive outcome rates between groups.