**Part 1: AI project Functional Methodologies**

**Project Strategy**

**Objectives**:

* Develop a model to predict customer churn with high accuracy.
* Identify customers at risk of churning before they leave the platform.
* Taking early actions to keep customers engaged and loyal to the company

**KPIs:**

* Reduction in churn rate.
* Increase in customer retention rate.
* Improved model accuracy (e.g., AUC-ROC score).

**AI's Contribution:**

* Analyze customer data to identify patterns and risk factors associated with churn.
* Automate churn prediction, enabling faster interventions.

**Project Design**

* **Data Sources:**
  + Customer demographics and account information.
  + Purchase history and product interactions.
  + Website and app usage data (e.g., browsing behavior, search queries).
  + Marketing campaign engagement data.
* **Data Challenges:**
  + Data quality issues (missing values, inconsistencies).
  + Data integration from various sources.
  + Customer privacy considerations.
* **Models:**
* Suitable models include Logistic Regression, Random Forests, Support Vector Machine
* Model selection will depend on data characteristics and project goals.
* **Model Training and Testing:**
* Split data into training and testing sets.
* Train the model on the training set and evaluate performance on the test set.
* **Model Versioning and Serving:**
* Implement version control for models to track changes and revert if needed.
* Develop a production-ready infrastructure for deploying and serving the model.

**Deployment**

* **Strategies:**
* Integrate API to connect the prediction model with customer live interaction
* Collecting data over a certain period and analyze them at regular intervals.
* **Considerations:**
* Scalability to handle large data volumes.
* Security measures to protect sensitive customer data.
* Monitoring infrastructure for model performance and potential biases.

**Monitoring**

* **Performance Monitoring:**
* Track KPI metrics to measure churn reduction and model effectiveness.
* Monitor model accuracy over time, and enhance it.
* **Model Drift Handling:**
* Supply the model with new data to address model drift.
* Schedule periodic evaluations to assess the need for retraining.

**Project Team**

* **Roles Needed:** Data Scientists, ML Engineer.
* **Cross-Functional Collaboration**: Regular interdisciplinary meetings, shared project management tools, and clear communication channels.
* **Skills and Expertise:** Data Scientists with machine learning and statistical analysis skills, Engineers with data pipeline and architecture expertise, and Analysts with business insight capabilities.

**Project Governance & Communication**

* **Stakeholders:**
* project sponsors
* Data Science team
* Marketing and customer support teams
* Business stakeholders
* **Communication Plan:**
* Regular project status reports.
* Technical documentation for the data science team.
* Clear communication of model outputs and limitations to business stakeholders.
* **Governance**:
* Establish a data governance framework to ensure data quality, security, and compliance.
* Define clear roles and responsibilities for project stakeholders.

**Project Management Methodology**

* **Agile Methodology:**
* Iterative development with short cycles for rapid adaptation and feedback.
* Well-suited for AI projects due to the iterative nature of model development.
* **Risk Management:**
* Identify potential risks (e.g., data quality issues, model bias).
* Develop mitigation strategies for each risk (e.g., data cleaning procedures, fairness checks).
* Continuously monitor and adapt risk management strategies.
* **Cost and Iteration Management:**
* Develop a cost estimation for project resources (e.g., data storage, computing power).
* Track costs incurred