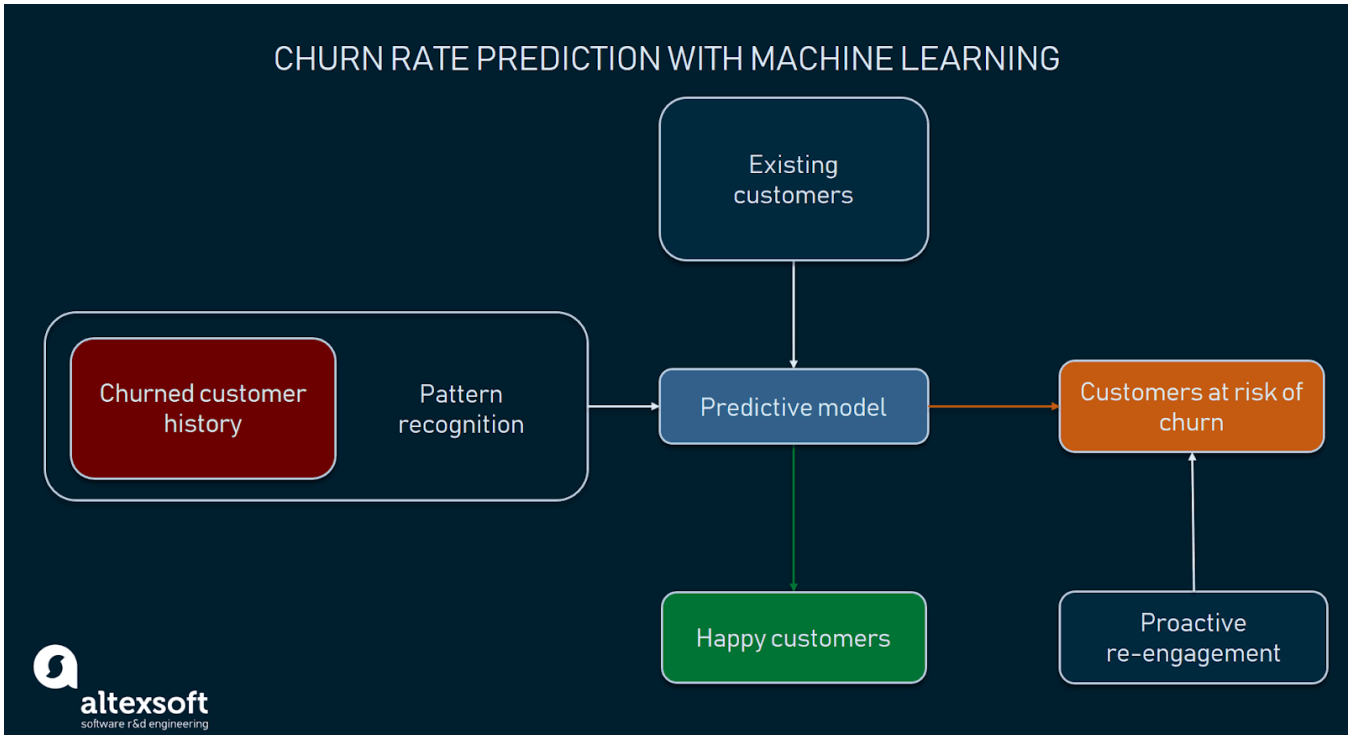
Phase 2
ML Model Deployment with IBM Watson Studio
(ISP Customer Churn Model)

Problem Statement:

Develop a predictive model using IBM Watson Studio to identify and forecast customer churn for an Internet Service Provider.



Step 1: Problem Definition and Data Collection

- **Define the Problem:** Internet Service Providers (ISPs) often face challenges in retaining their customers due to the competitive nature of the industry and various factors that influence customer decisions. Churn, which refers to the rate at which customers discontinue their subscriptions and switch to other providers, can have a

significant impact on a provider's profitability and sustainability. Therefore, the goal is to create a predictive model that can anticipate when customers are likely to churn, allowing the ISP to take proactive measures to retain those customers.

- **Collect Data:** Gather historical data on customer interactions, service usage, billing, and churn. You might need data like customer profiles, usage patterns, contract details, and customer churn outcomes.

- **Data Cleaning and Preprocessing:** This includes handling missing values, removing duplicates, and encoding categorical data into a numerical format. Data preprocessing may also involve feature scaling and normalization.

Step 2: Data Exploration and Analysis

- **Data Exploration:** Use descriptive statistics, data visualization, and correlation analysis to gain insights into the data. Understand the distribution of features and identify potential patterns or trends related to churn.

- **Feature Engineering:** Create new features that might be relevant for the churn prediction task. This could involve feature extraction, transformation, and selection.

Step 3: Model Development in IBM Watson Studio

- **IBM Watson Studio Setup:** Ensure access to IBM Watson Studio. Set up your environment with the required tools and libraries.

- **Data Upload:** Upload the preprocessed dataset to IBM Watson Studio's data assets.

- **Split Data:** Split your data into training and testing sets. Typically, you'd use 70-80% of the data for training and the rest for testing.

- **Select Algorithms:** Choose suitable machine learning algorithms for churn prediction task. Common choices include logistic regression, decision trees, random forests, and gradient boosting.

- **Model Training:** Train selected models using the training data. Experiment with different hyperparameters and algorithms to find the best-performing model.

- **Model Evaluation:** Use appropriate evaluation metrics (e.g., accuracy, precision, recall, F1-score) to assess the model's performance. Cross-validation can help ensure robustness.

- **Hyperparameter Tuning:** Optimize the hyperparameters of models to improve their performance. Tools like Watson AutoAI can assist in this process.

- **Model Selection:** Select the best-performing model for deployment.

Step 4: Model Deployment

- **Model Deployment in IBM Watson Studio:** Use Watson Studio to deploy your selected model as an API. This allows you to make predictions on new data.

- **API Integration:** Integrate the deployed model API with ISP's infrastructure. This step may involve working with team to set up the necessary endpoints.

Step 5: Real-time Predictions

- **Real-time Predictions:** As customers interact with ISP's services, use the deployed model to make real-time predictions on their likelihood of churning. This can help in proactive retention efforts.

Step 6: Monitoring and Maintenance

- **Model Monitoring:** Continuously monitor the model's performance in a production environment. Use techniques like A/B testing to ensure the model remains effective.

- **Model Re-training:** Periodically retrain the model with updated data to keep it up-to-date and improve its accuracy over time.

Step 7: Reporting and Insights

- **Generate Reports:** Create reports and dashboards to visualize model performance, customer churn trends, and the effectiveness of churn prevention efforts.

- **Feedback Loop:** Use insights from the model and reports to inform business strategies and marketing campaigns. Continuously gather feedback and adjust strategies as needed.

Conclusion:

By following these steps, we can transform your initial design concept into a practical customer churn prediction model for an ISP using IBM Watson Studio. This process involves data collection, preprocessing, model development, deployment, and ongoing monitoring to reduce customer churn and improve business outcomes.