# AI RECOMMENDER SYSTEM SOLUTION
# A CONTEXTUAL PERSONALIZATION ENGINE

Our contextual personalization AI engine is designed to suggest relevant personalized actions to users. Using Bigrio AI Recommender system solution, you can choose appropriate actions tailored to your need to maximize your customized return based on your organizational goal. Our solution learns from your data and provide robust personalized actions that adapt instantly to your customers' behavior. Moreover, this solution can provide offline evaluation of each scenario or policy and eliminate the guess work in A/B testing of your scenarios.

## AI RECOMMENDER SYSTEM SOLUTION USE CASES

- Promise the best delivery date on your ecommerce site
- Recommend the best discount offer to your customers
- Provide insight to your marketing actions
- Recommend which content or product to display to the user for your online stores
- Rank advertisements for your audience
- Select the best image or content to show on your web page or offer
- Recommend the next music or video at the end of the playlist

## ILLUSTRATIVE EXAMPLE

A client supports millions of B2B consumers. The client is capable of delivering the purchased items the next day at any location in US. However, next day delivery is very costly. And long delivery promise may decrease the customer's satisfaction. Or customers decide to shop on competing businesses which lead to the loss of revenue.

## THE PROBLEM

The client needs a solution to recommend best delivery date for customers. A short delivery promise will cost significant amount of money. And a long delivery promise may result in customers purchase from competitors. They would like to have an automated process to recommend the best delivery promise to optimize the revenue of their business.

## THE SOLUTION

AI recommender system solution provide the best delivery promise using Reinforcement Learning/ Contextual bandit algorithm-based pipeline trained on costumer data. Then, our solution evaluates the policy in an Offline form using existing customer data. Our Offline evaluation solution provide an estimate for the revenue gain before A/B testing the new recommendation policy in production.

## TECHNOLOGY ASPECTS

Our AI Recommender system solution is an adaptive AI platform capable of inducing RL policies using several state-of-the-art AI algorithms. Our customers could select their preferred AI model from an entire suite of algorithms. Our AI Recommender system solution has two different engines. The decision tree-based RL algorithms and deep learning-based algorithms.

## DECISION TREE-BASED RL ALGORITHMS

Our decision tree-based Recommender system engine is capable of utilizing Random Forest, Gradient boosting and XGBoost base estimators to build a reward model for each alternative or arm. Our policy induction engine utilizes a cost sensitive classifier policy induction using the same decision tree based base estimators. At the end, the policy evaluation component can assess the induced policy using the doubly robust policy evaluation and learning algorithm.

## DEEP LEARNING-BASED ALGORITHMS

Our deep Q learning recommender system engine is capable of fining the optimal policy and recommend the best action in highly complex tasks. By maximizing the expected value of the total reward over any and all subsequent steps, starting from the current state, our deep Q-learning RL solution discovers an ideal policy. At the end, similar to the Decision tree-based RL algorithms, the policy evaluation component can assess the induced policy using the doubly robust policy evaluation and learning algorithm.
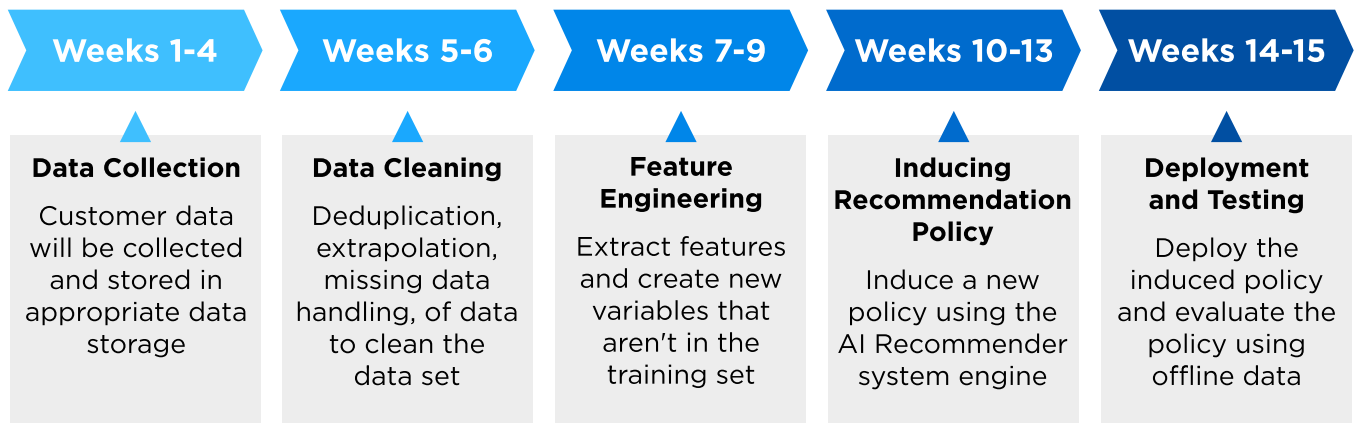
# Which recommender system algorithms is right for you?

Our AI Recommender system solution is highly configurable based on the client's needs and requirements. However, the offline evaluation of the induced policy on customer data is the final arbiter for selecting the best algorithm for each client's use case. BigRio data science team will work and collaborate with the client and partners to find the best configuration of our AI Recommender system solution based on client's needs and data.

# VALUE PROPOSITION

AI Recommender system solution provide personalize and effective actions using large volume of real-life customer data. With that in mind we are looking for collaboration partners to run Proof of Concept (PoC) projects. These POCs will take 15 weeks to run.

| Weeks 1-4 | Weeks 5-6 | Weeks 7-9 | Weeks 10-13 | Weeks 14-15 |
|---|---|---|---|---|
| **Data Collection**<br><br>Customer data will be collected and stored in appropriate data storage | **Data Cleaning**<br><br>Deduplication, extrapolation, missing data handling, of data to clean the data set | **Feature Engineering**<br><br>Extract features and create new variables that aren't in the training set | **Inducing Recommendation Policy**<br><br>Induce a new policy using the AI Recommender system engine | **Deployment and Testing**<br><br>Deploy the induced policy and evaluate the policy using offline data |

Collaboration partners will receive favorable transaction pricing for participating in this POCs (discounts ranging from 25%-50% depending on length of contract) and the amount paid for the POC will be adjusted against the implementation fees.

Please reach out, we would be happy to discuss your needs and work together towards a solution.