What is Personalizer ?

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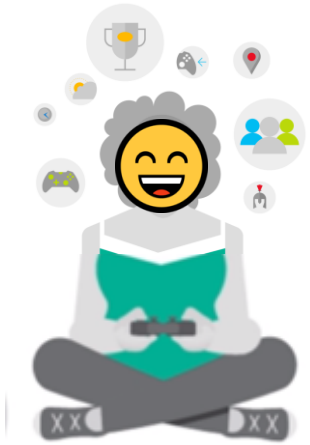
Example..



Your Users

Have Fun!

We think you'll like...

Join

Your App

User & Context Info

Play

Watch

Join

Play

Action 1 info

Watch

Action 2 Info

Join

Action 3 Info

Rank(..)

Join

Personalizer Service

Reward(r)

Your business logic observing & evaluating user behavior

Reward Score

Show me some code

Rank(..)

User& Context info

```
user = [{'age': 20}]
actions = [
    models.RankableAction(
        id = 'politics',
        features = [{'topic': 'politics'}]),
    models.RankableAction(
        id = 'sports',
        features = [{'topic': 'sports'}])]

request = models.RankRequest(
    context_features=user,
    actions=actions
)

response=client.rank(request)
```

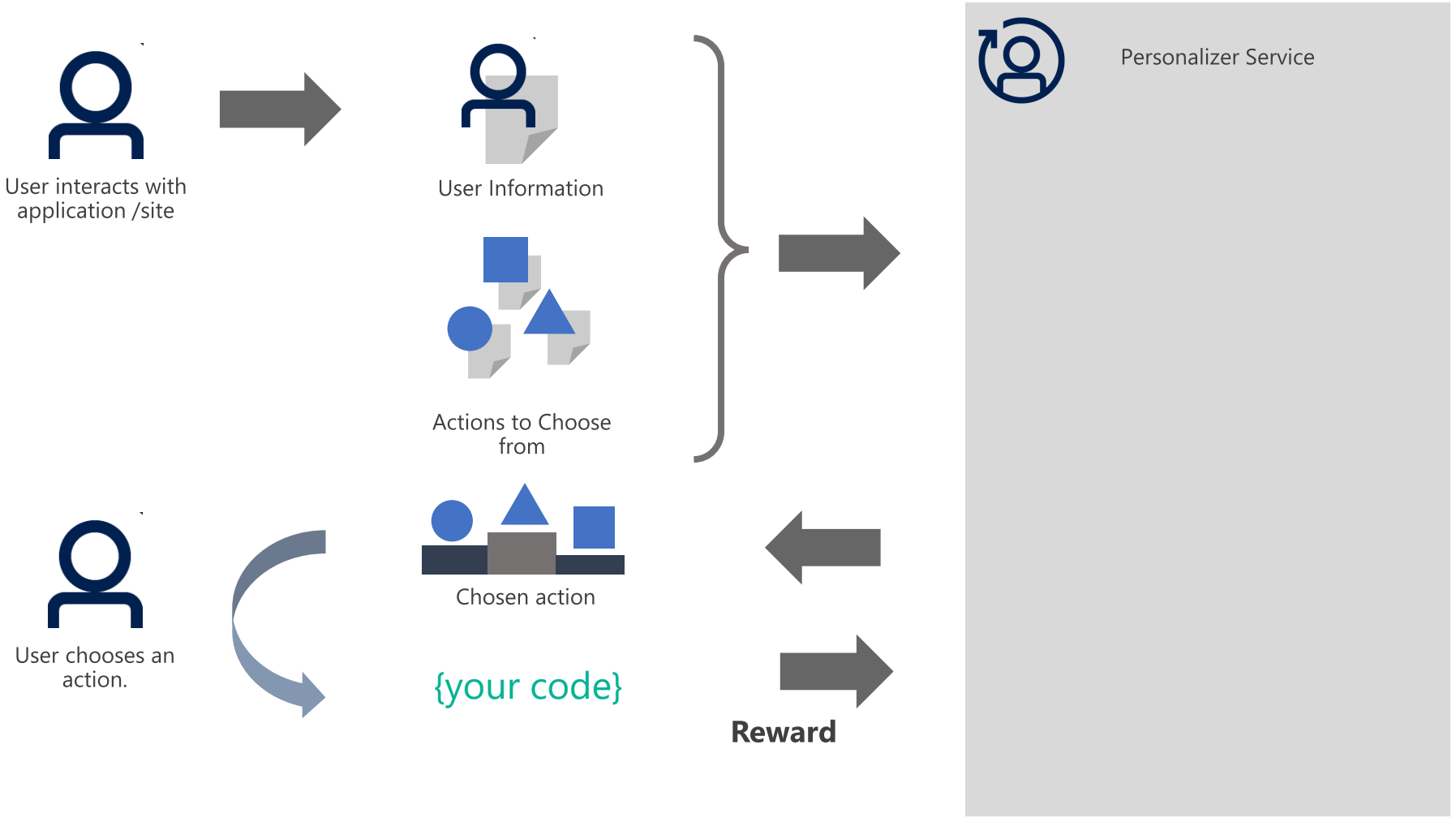
Actions

Rank it!

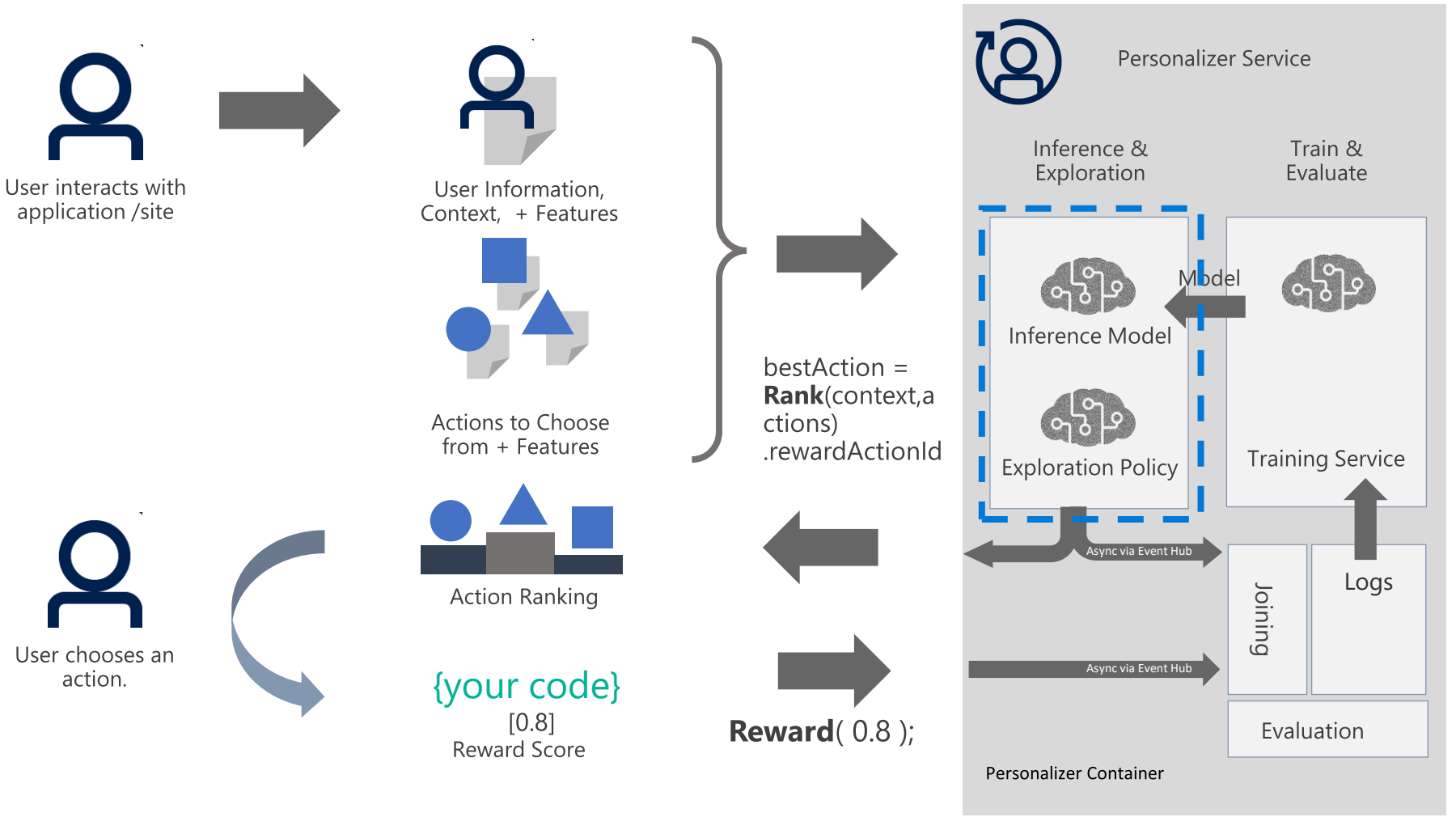
Now, the reward

```
reward = 0.3
client.events.reward(event_id=event_id, value=reward)
```

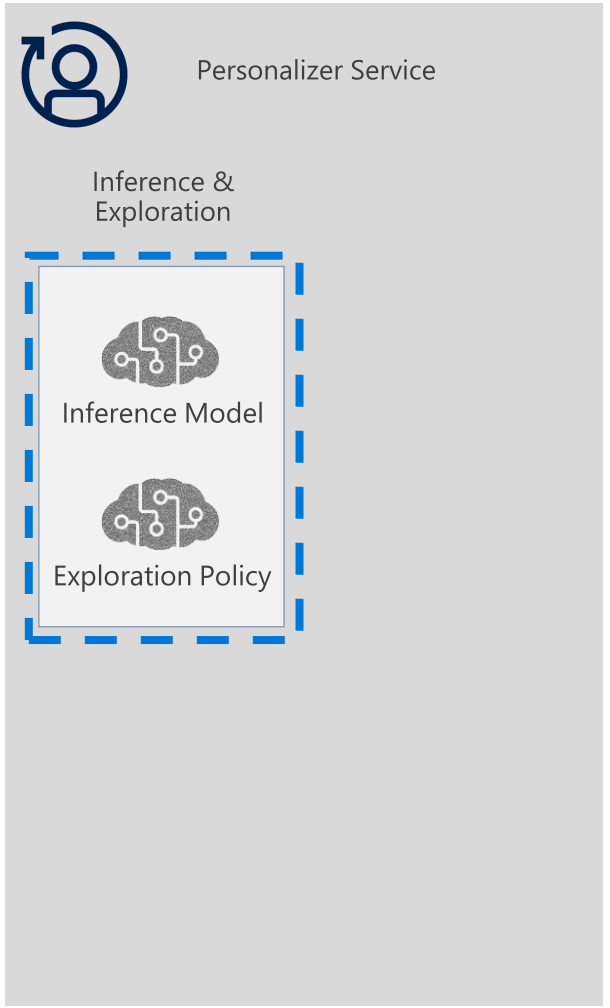
How does it look inside?



It’s a complicated box…

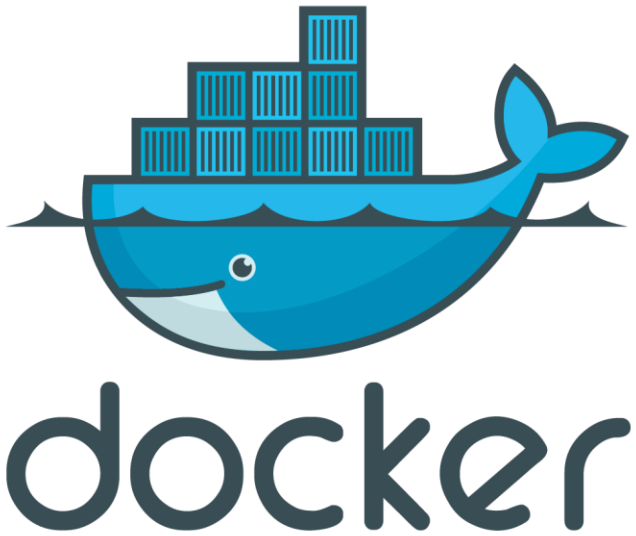


The brains


Personalizer Service
Inference &
Exploration
Inference Model
Exploration Policy

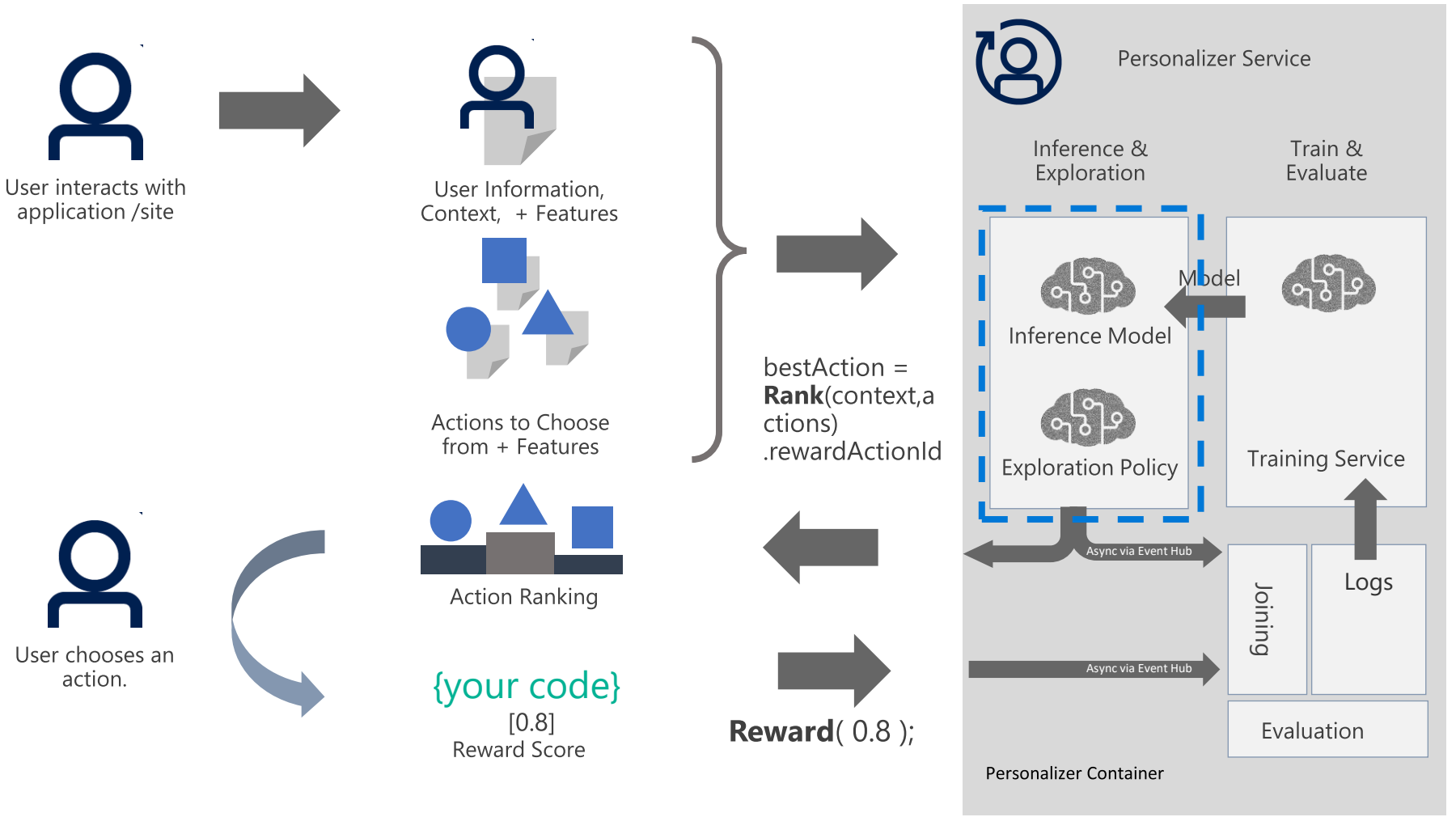
www.vowpalwabbit.org

VOWPAL WABBIT

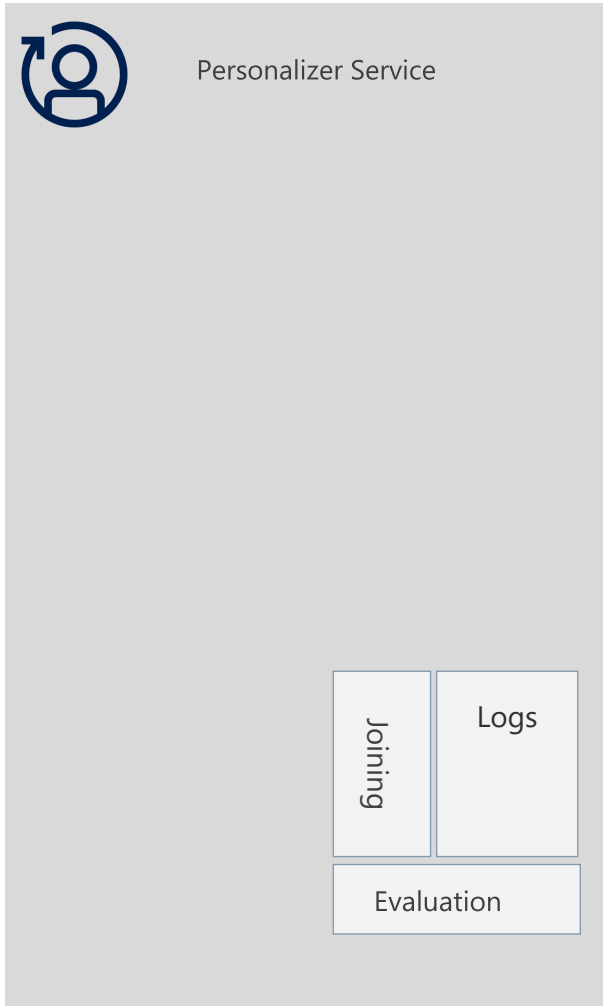


Http service wrapped in a container

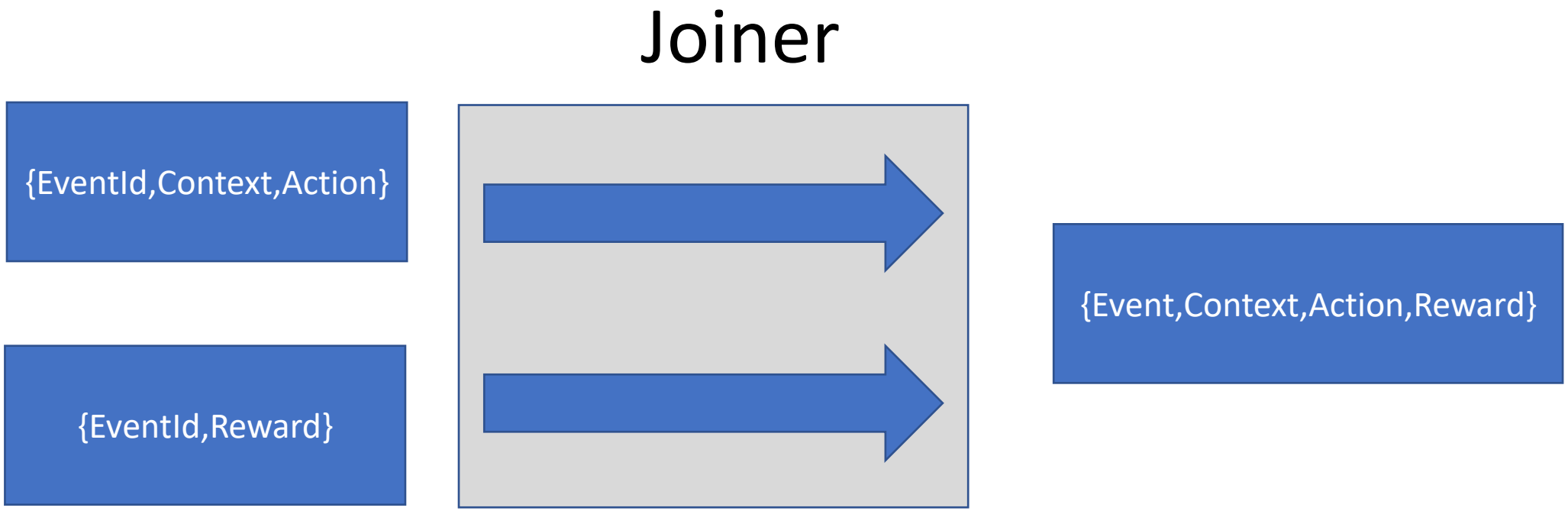
Logs & Joining



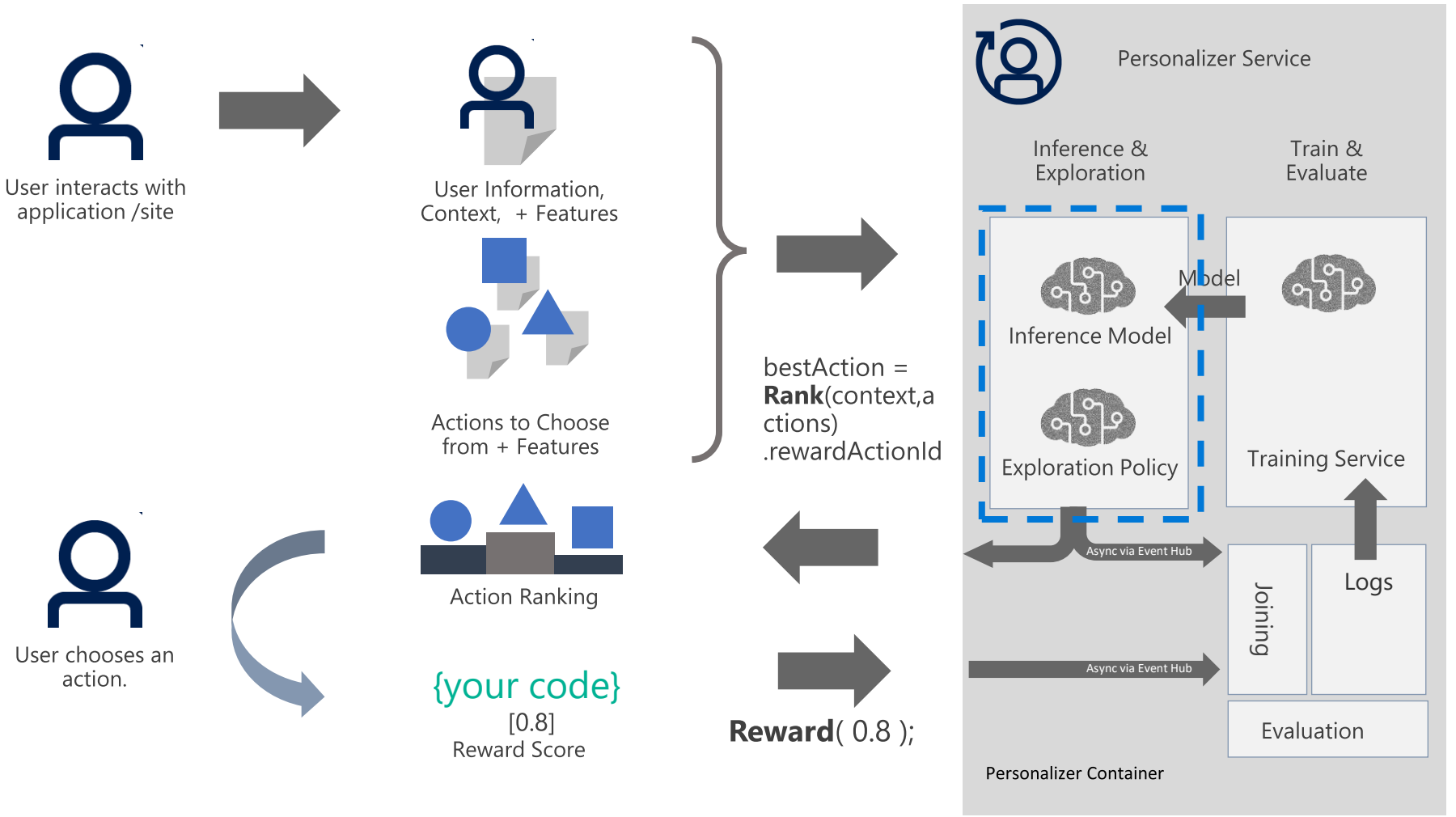
Logs & Joining



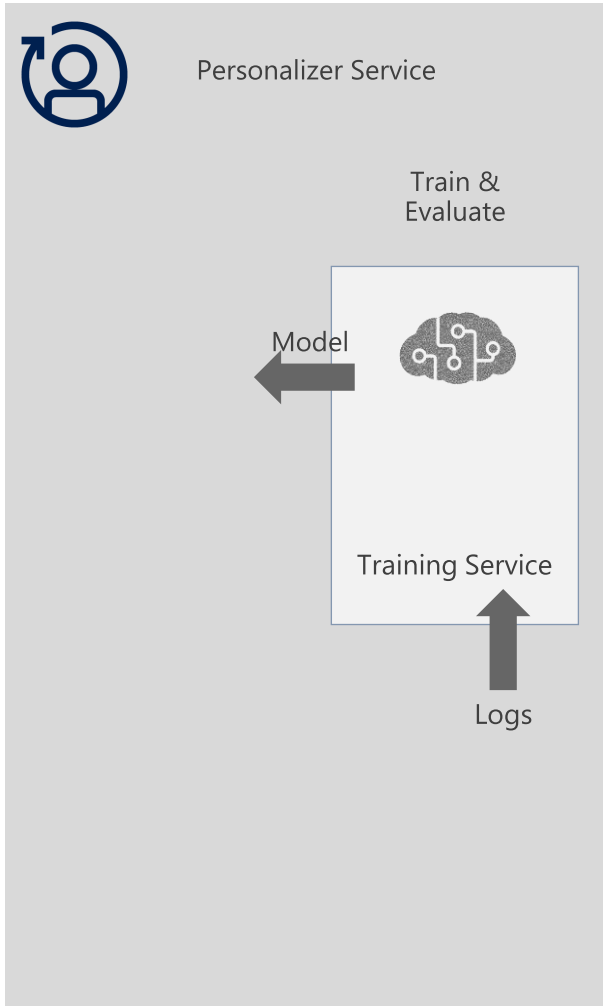
Logs & Joining



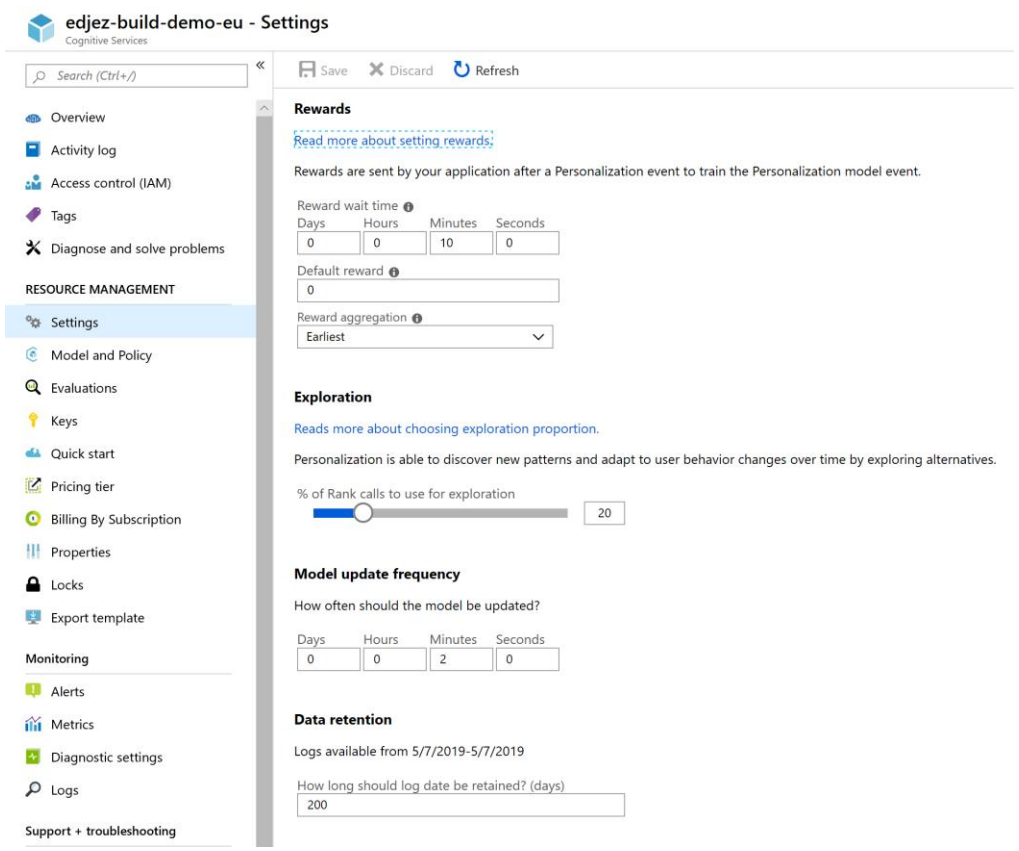
Trainer

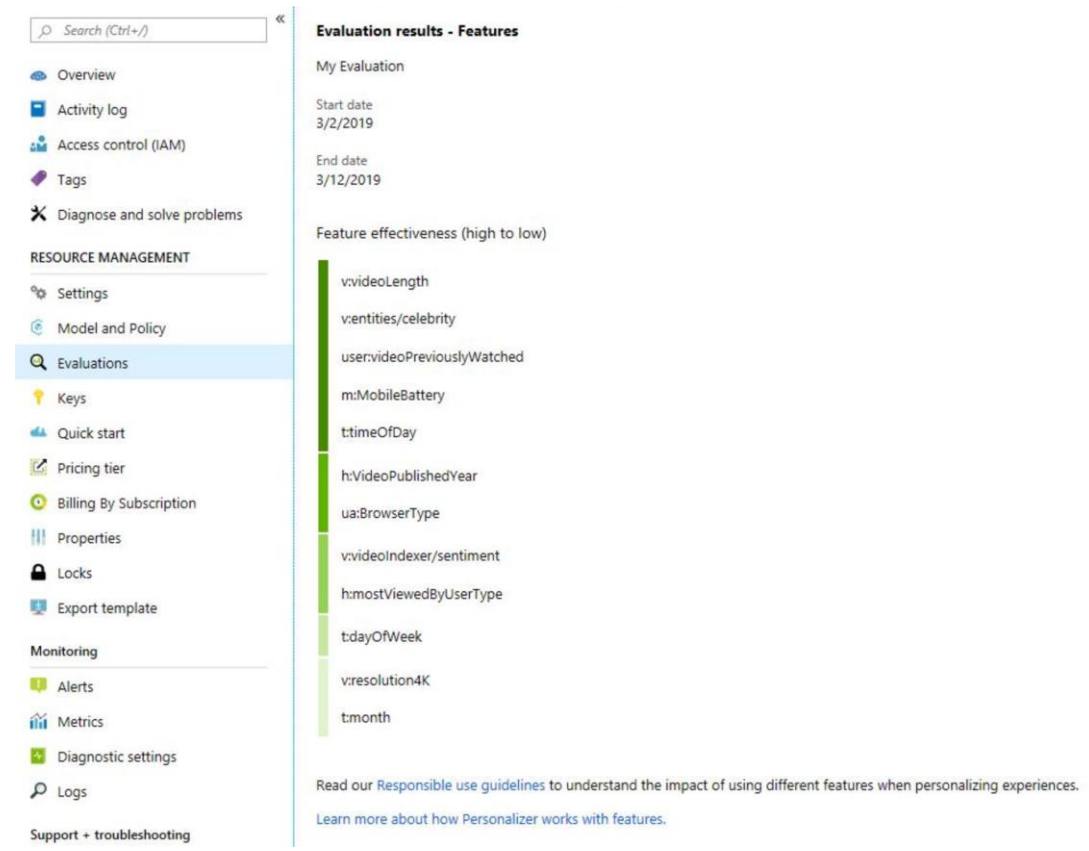

User interacts with application /site
User Information, Context, + Features
Actions to Choose from + Features
bestAction = **Rank**(context,actions) .rewardActionId
Personalizer Service
Inference & Exploration
Train & Evaluate
Model
Inference Model
Exploration Policy
Training Service
Async via Event Hub
Logs
Joining
Async via Event Hub
Evaluation
Personalizer Container
User chooses an action.
Action Ranking
{your code}
[0.8]
Reward Score
Reward(0.8);

Trainer

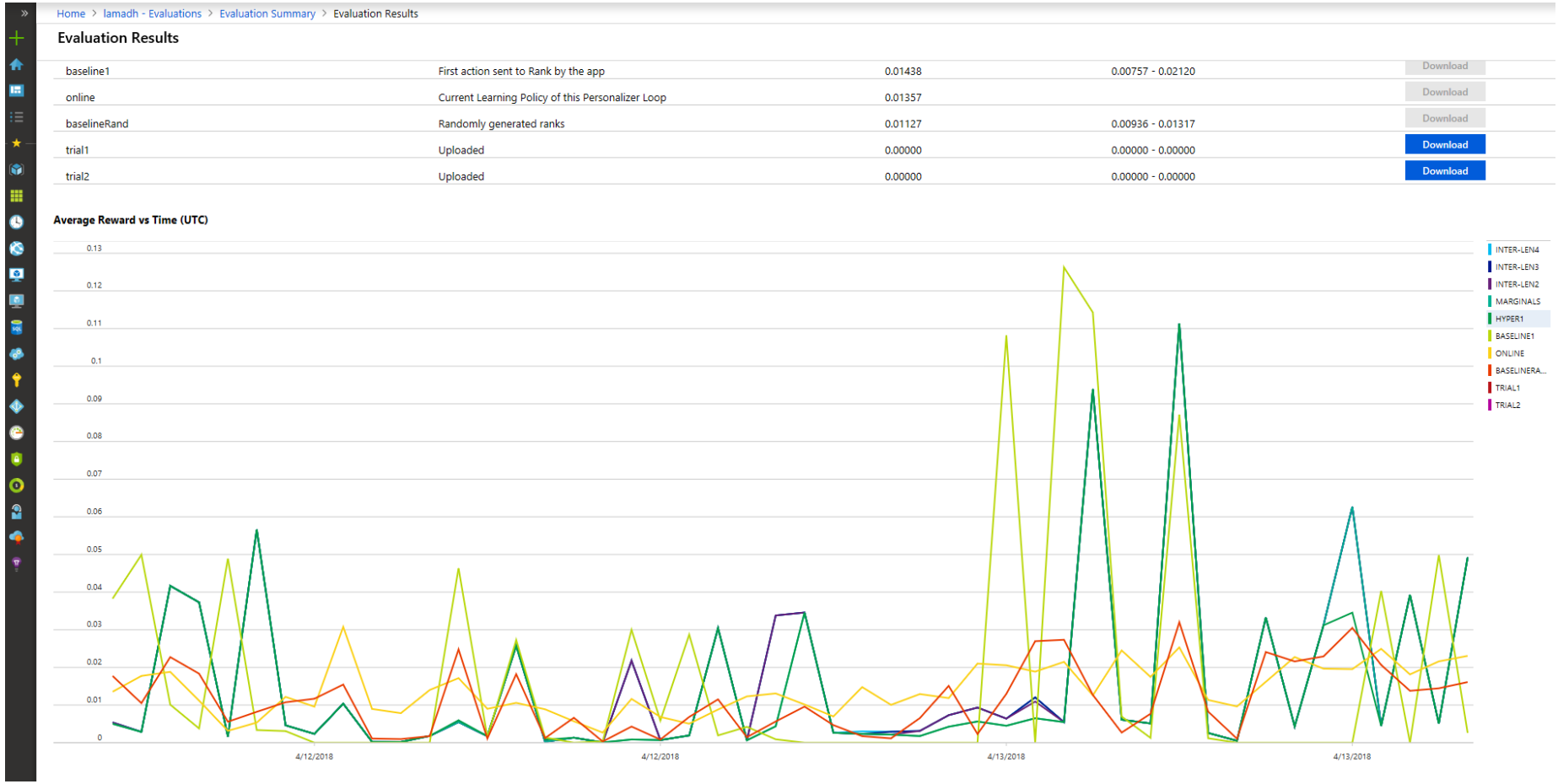

Personalizer Service
Train &
Evaluate
Model
Training Service
Logs

Azure Portal



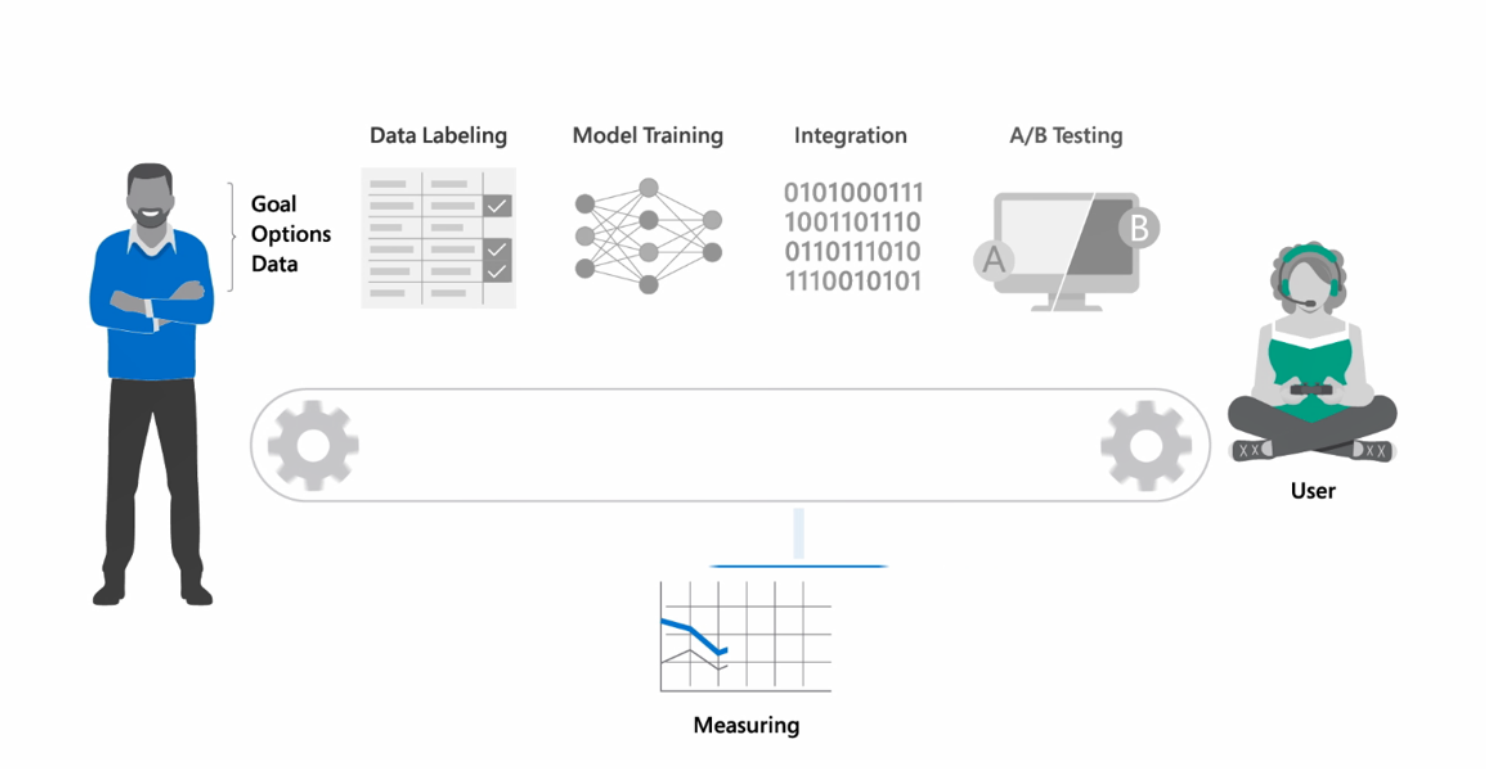


Model optimization



Top signs that you have a Reinforcement Learning Problem

Hard to collect, measure or label data



Need Right Signal for Right Answer

Is  interesting to Rodrigo  ?

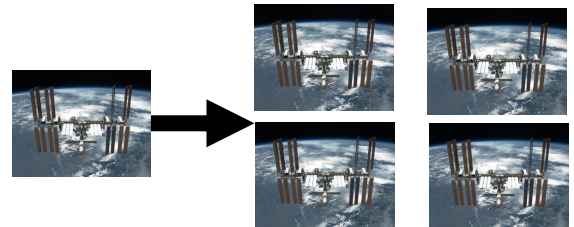
Cat emoji by: https://commons.wikimedia.org/wiki/File:Phantom_Open_Emoji_1f63a.svg

Training data doesn't generalize

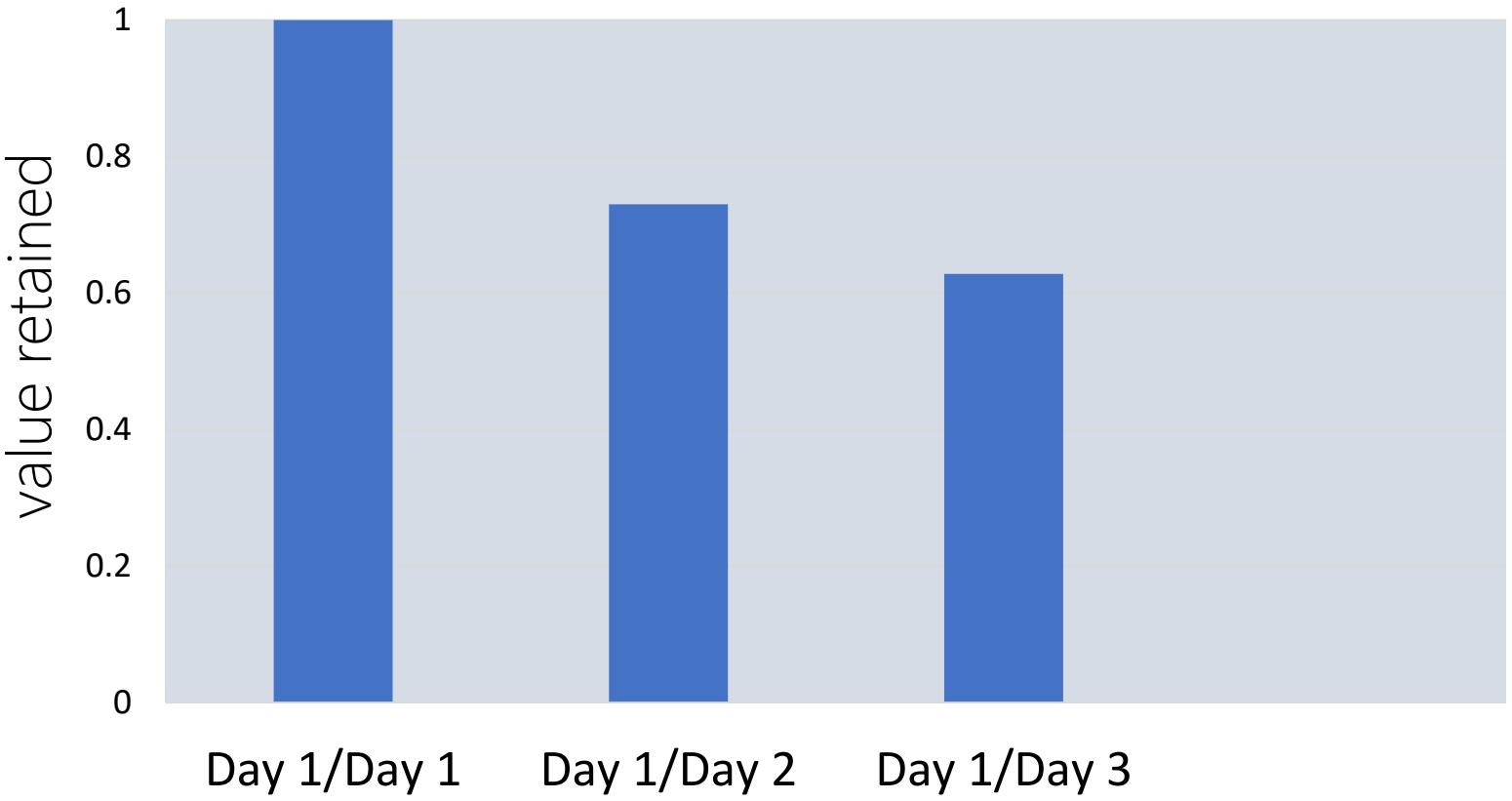
What is the probability of click on a food article

If you only display a space article?

We must avoid "self-fulfilling prophecy"



Model performance degrades fast



The world changes!

Questions?

Thank you!

Azure Portal
http://aka.ms/personalizer

Feedback in UserVoice
http://aka.ms/personalizer-uservoice

Research Tutorial
http://hunch.net/~rwil

ML underpinning: Vowpal Wabbit

ML innovations: Conditional contextual bandits