



An innovative recipe box delivery company

S2DS TEAM PROFILES



Giovanni

- PhD: Quantum Optics
- Music enthusiast



Lisa

- PhD: Computational Chemistry
- Keen traveller



Arya

- PhD: Quantum Physics
- Crisis Manager



Valentina

- PhD: Quantum Physics
- Cookery enthusiast



Keishi

- PhD: Organic Chemistry
- Likes food

MINDFUL CHEF – COMPANY OVERVIEW

*Mindful
Chef*

A diverse range of fresh
and healthy recipes

16 different recipes
offered each week

Gluten and dairy free

Pause any time

Every meal bought donates
one to a child in need

Ethically sourced
produce



PROJECT OBJECTIVE

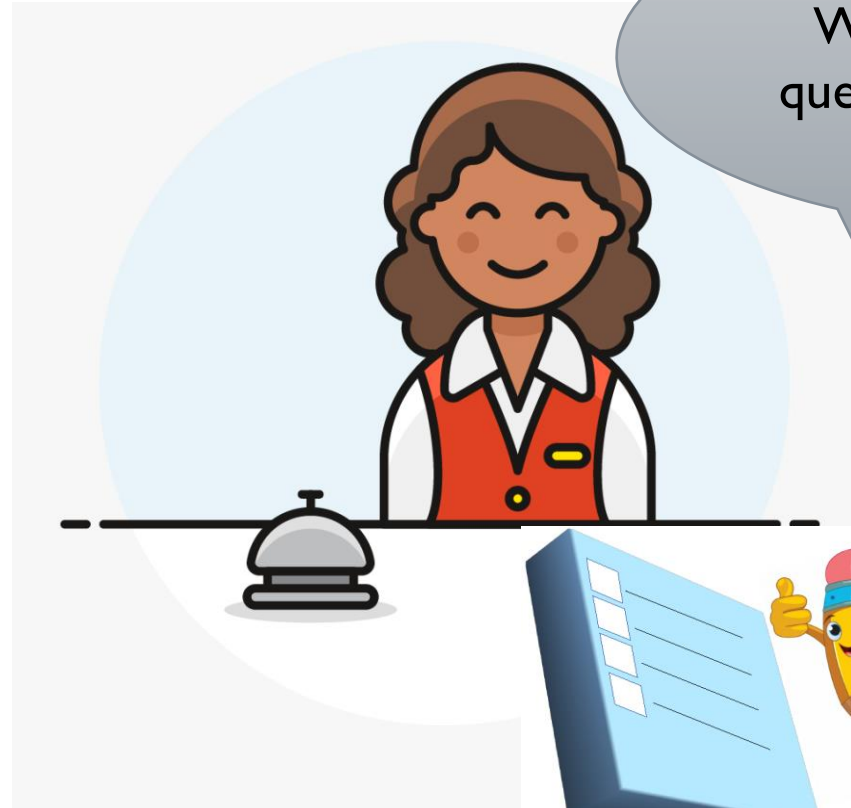


COLD-START PROBLEM

How can the digital waiter acquire knowledge about the food preferences of a **new customer**?

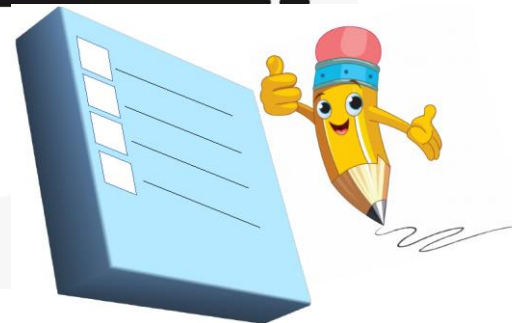


ONBOARDING GAME

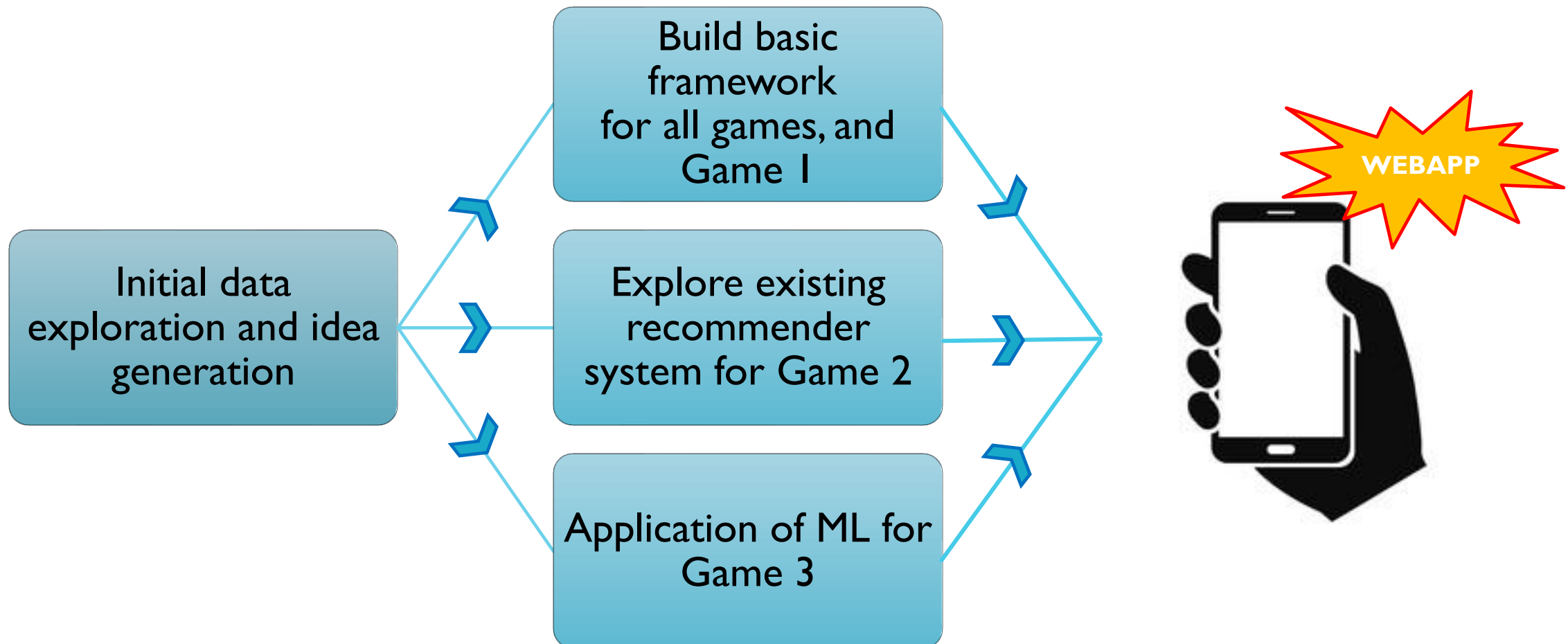
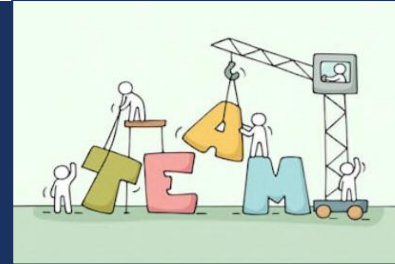


Welcome!

We'd like to ask a few questions to get to know you better



PROJECT STREAMS (EARLY/MID)



PROJECT STREAMS (LATE)



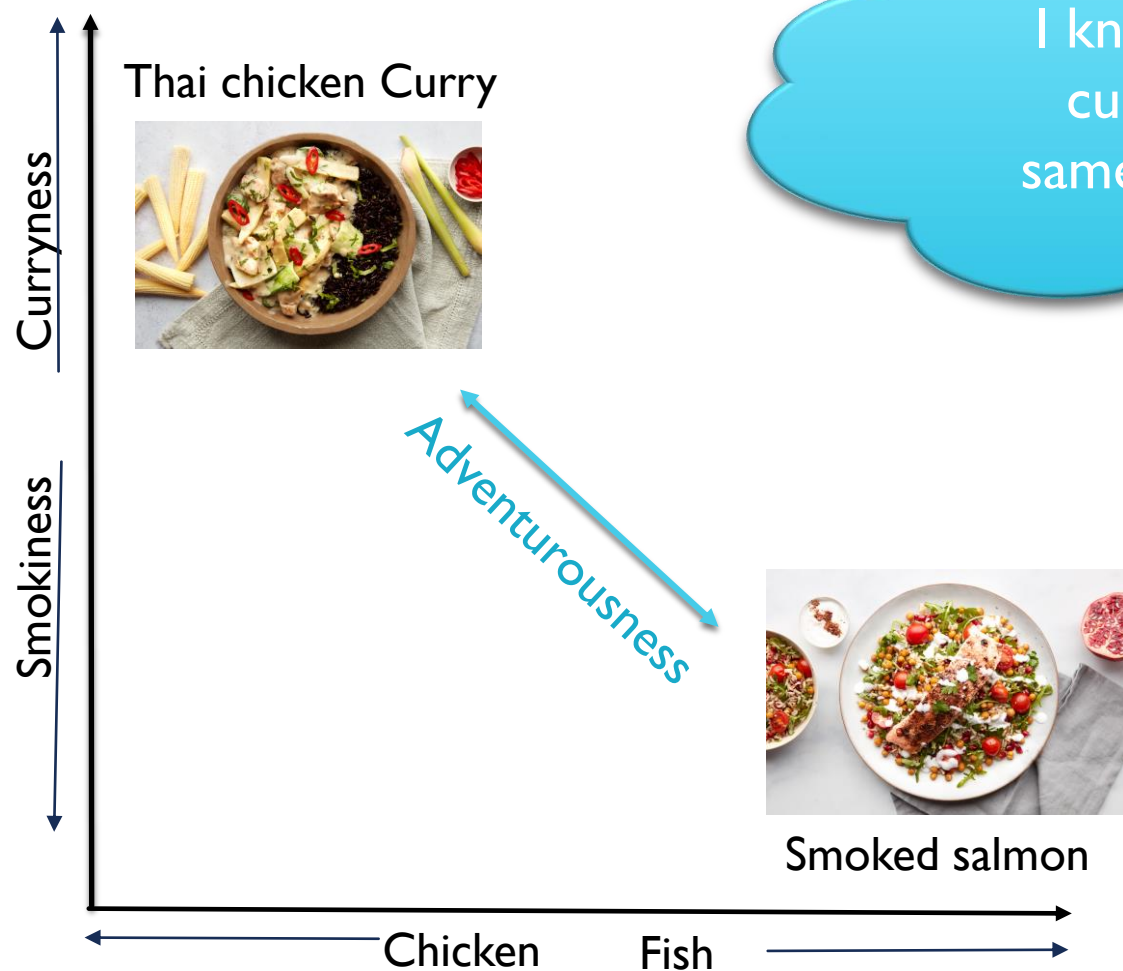
A/B testing:
which tool gives the best
prediction for
adventurousness?



Analysis of results
from tool &
final recommendation



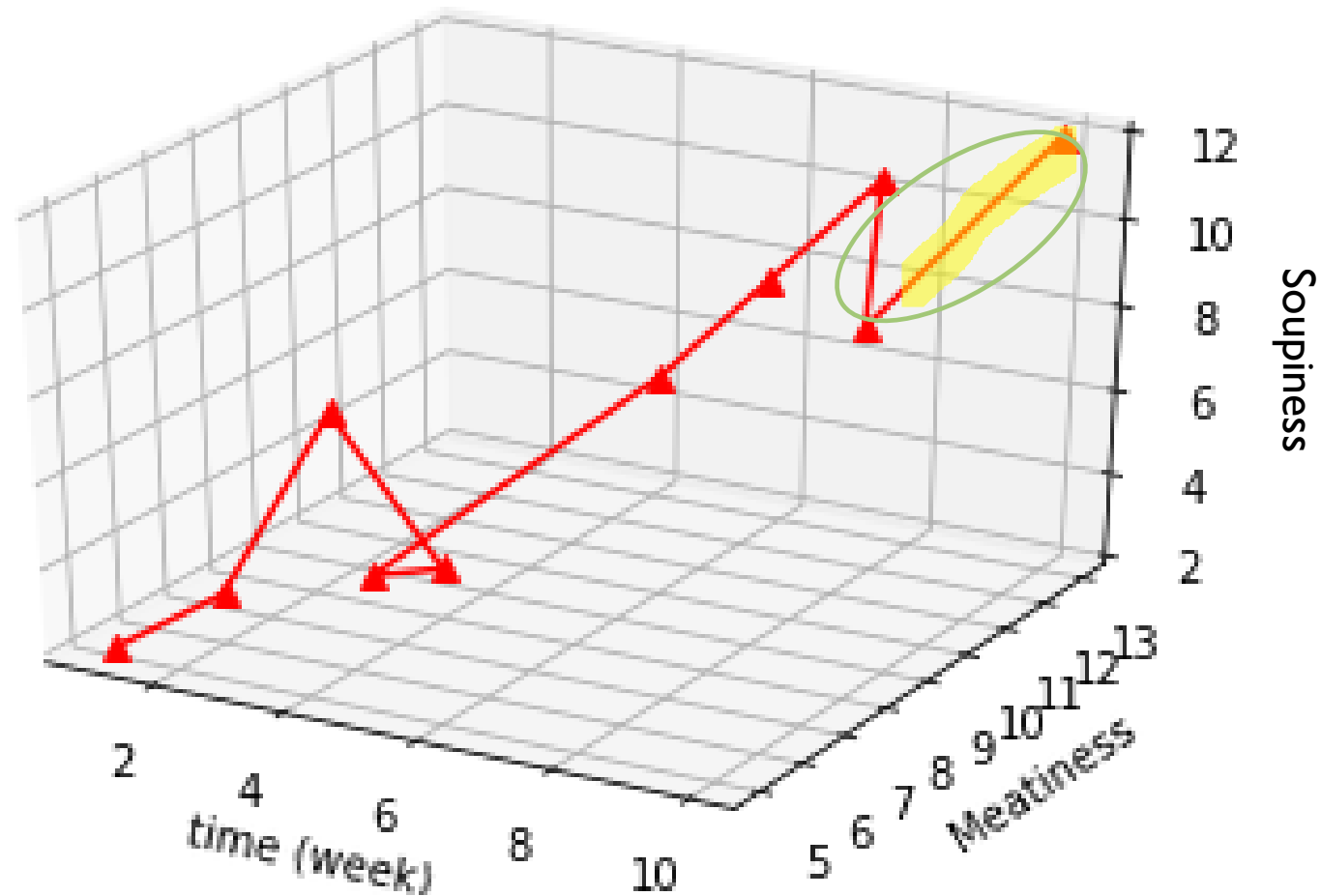
ADVENTUROUSNESS



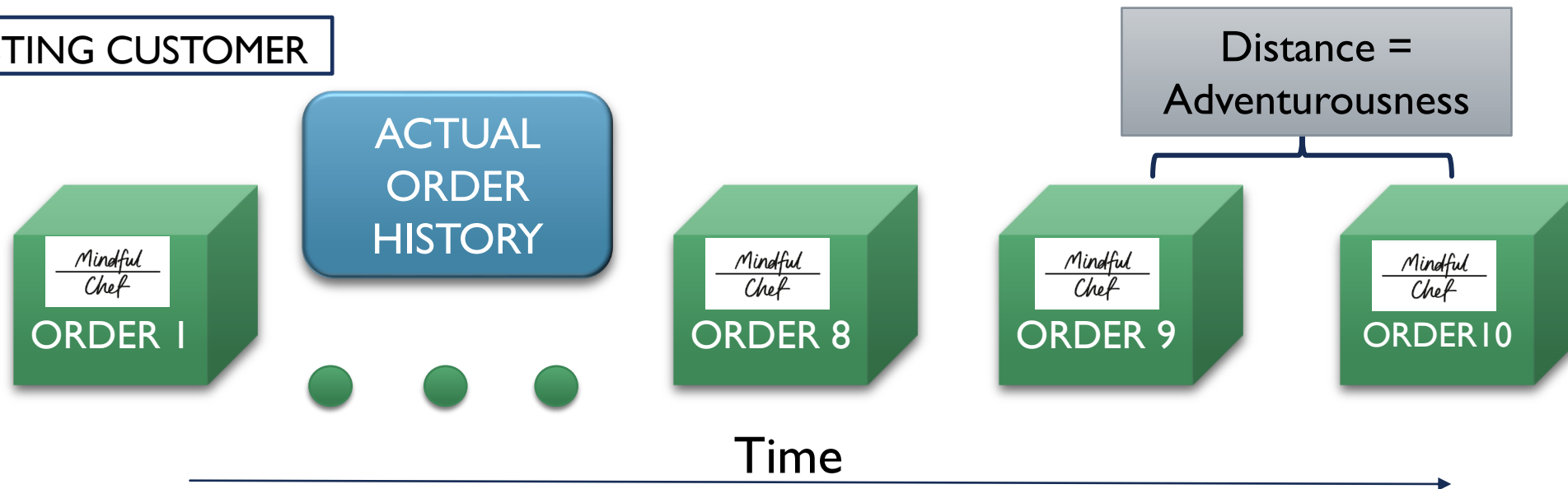
I know she likes Thai chicken curry. Should I suggest the same, or something different - Smoked salmon?



JOURNEY THROUGH RECIPE SPACE



EXISTING CUSTOMER



NEW CUSTOMER

ONBOARDING
GAME



FAKE ORDER
HISTORY

Mindful
Chef
ORDER 1

Mindful
Chef
ORDER 2

Distance =
Adventurousness

CHALLENGES

- End-to-end development of web app
- Time limit of 60 seconds
- Understanding existing recommender system
- Clustering of recipe data
 - Text analysis
 - Interpretation of clusters



GAME 1: BASELINE – RANDOM CHOICE



- Random recipes are chosen from all recipes
- No consideration of new customer preferences, what is trending, and so on
- Effectively the current on-boarding tool for Mindful Chef

GAME I: explanation

Customer chooses 2-5 recipes



X



X



similarly ...



GAME 2: CHARTING FOOD SPACE USING TEXT DATA

"Thai red tofu curry
with wild rice"

Process textual data for all recipes

Vector
(0.004, -0.013, 0.052, 0.011...)

Based on the most defining features of all recipes

Generate recipe XYZ coordinate
(1.4, 0.5, 0.6)



Recipes naturally fell into clusters by food group

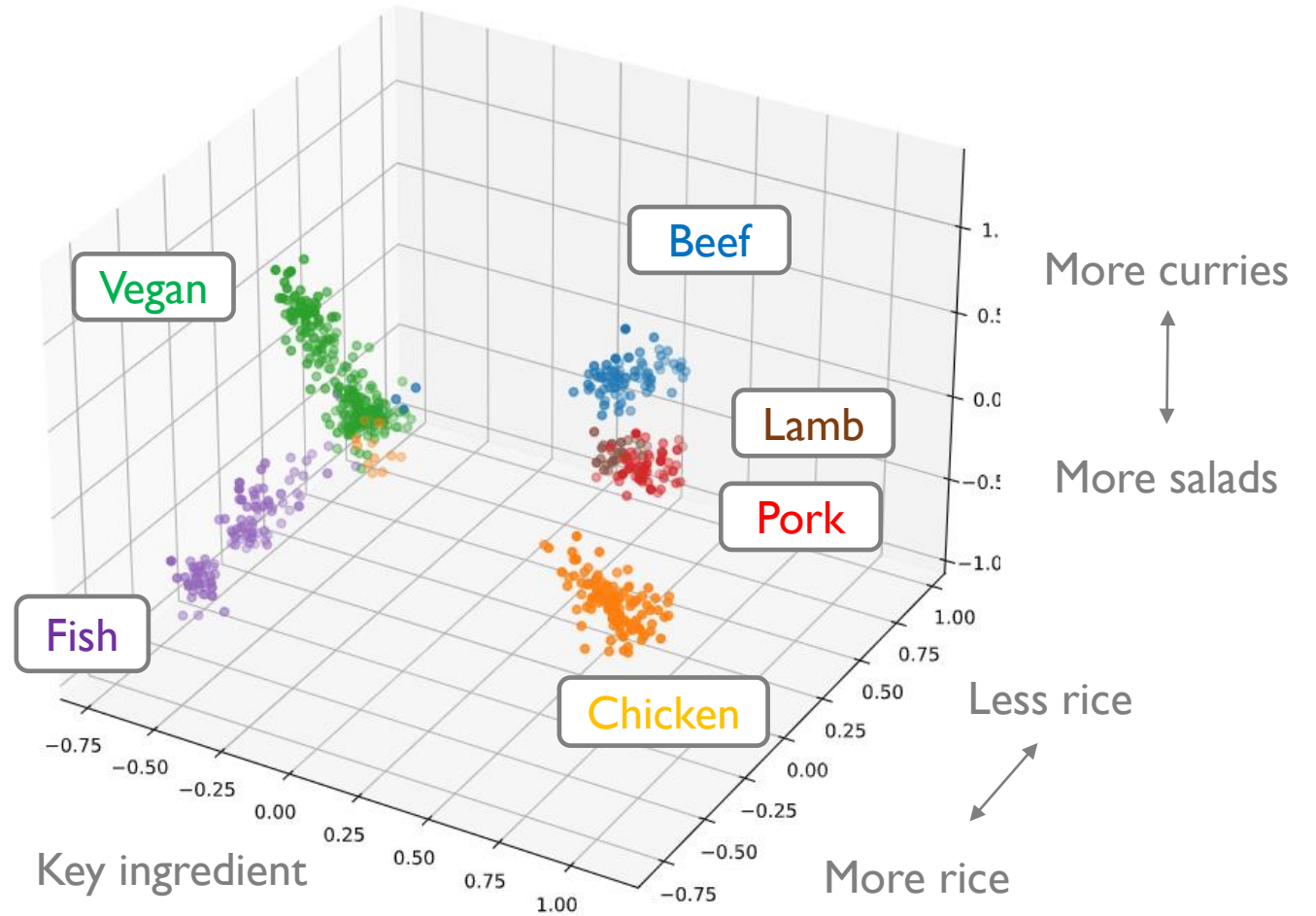


Pick images at the extremes and midpoints of food group clusters

Let me suggest you the most popular dishes!



Plotted food space



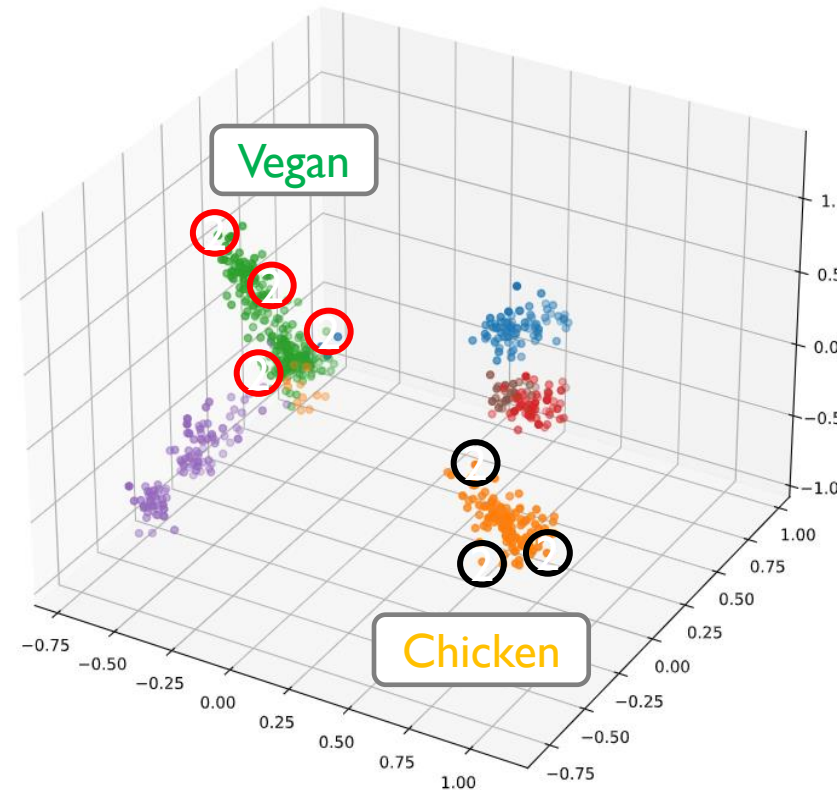
1 User selects food groups



3 Repeat Step 2, to make two virtual orders



2 10 images are shown at extremes and midpoints within these food groups



Measures adventurousness within and between food groups

GAME 3: CLUSTERING RECIPES

Recipe
table

Food group	Price	Allergens	Cuisine	Title	Key ingredients	Description	-----
-----	-----	-----	-----	-----	-----	-----	-----

Topic modelling: 4 topics

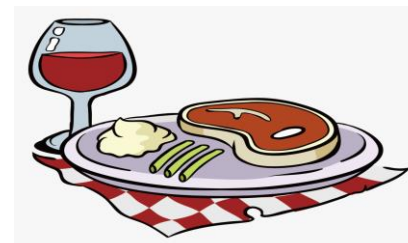
Salads



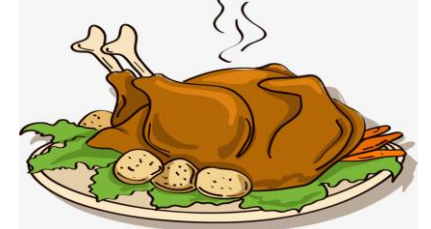
Curries



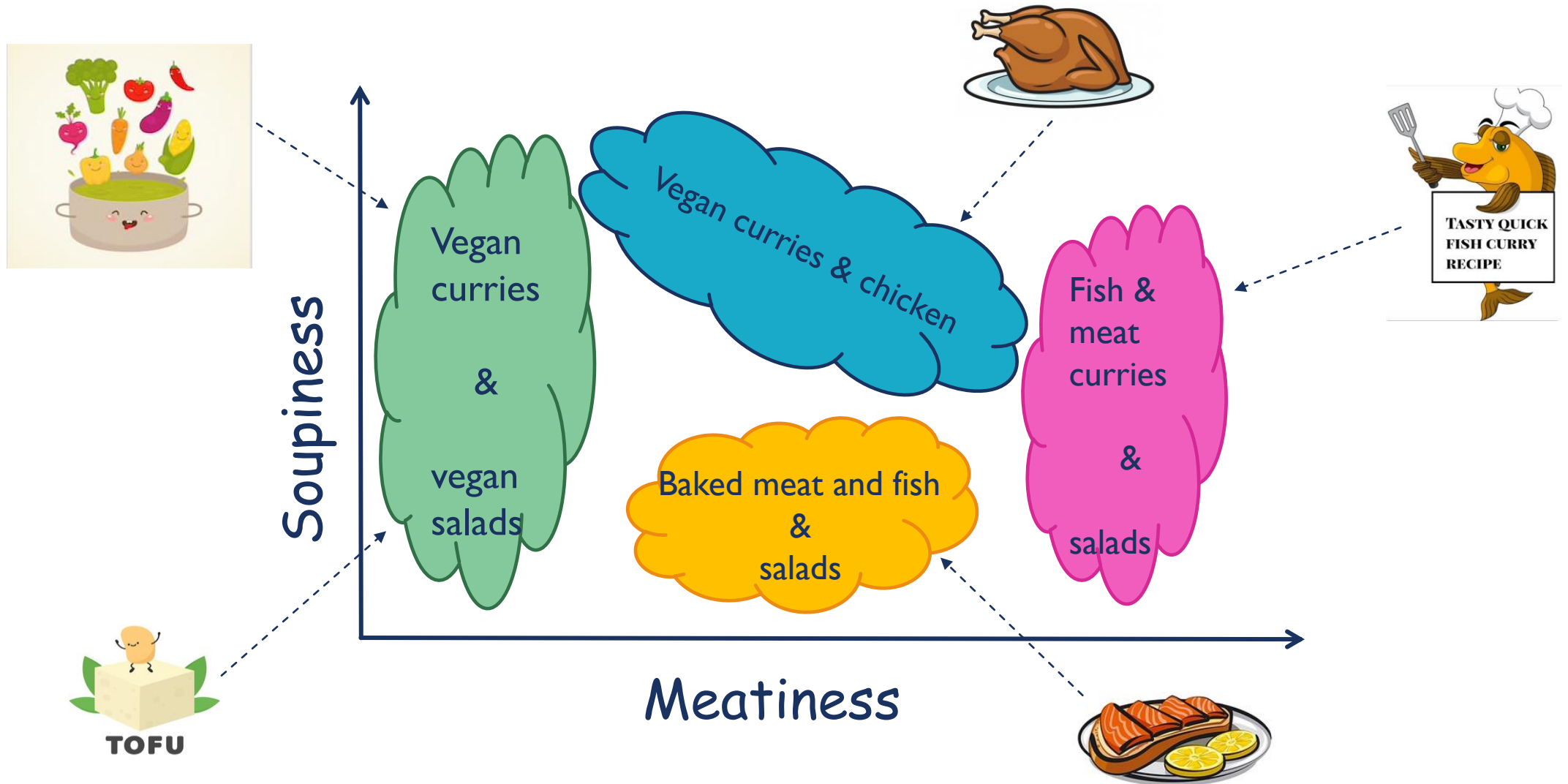
Traditional English dishes



Everything else



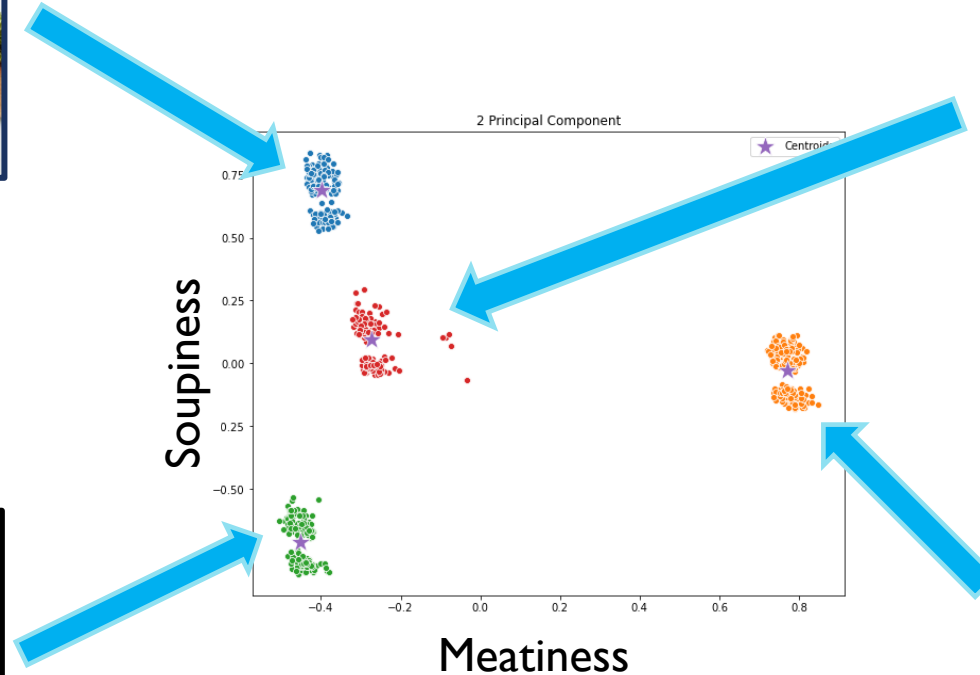
GAME 3: clustering recipes



GAME 3: detecting customer behaviour



X



X

Customer chooses
2-8 recipes per page

GAME 3: explanation



Cluster 1
33%

Cluster 2
33%



Cluster 3
22%



Cluster 4
11%

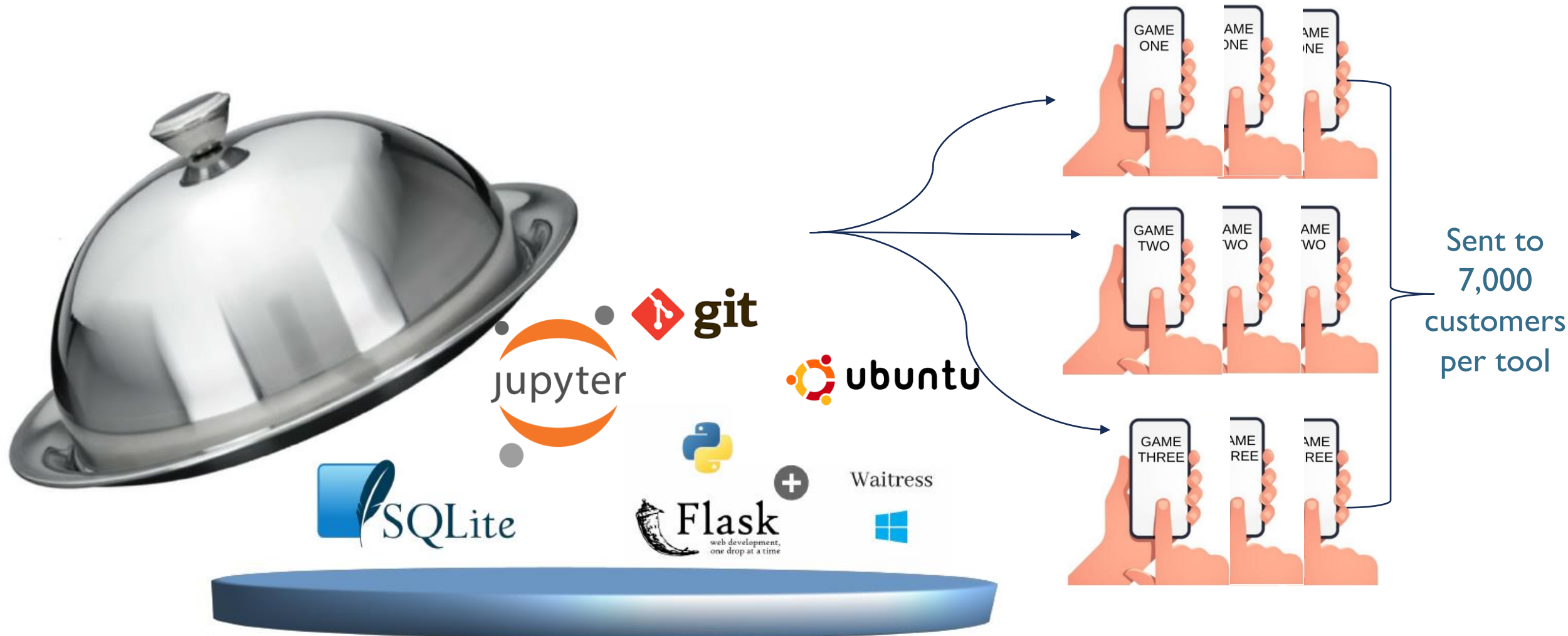


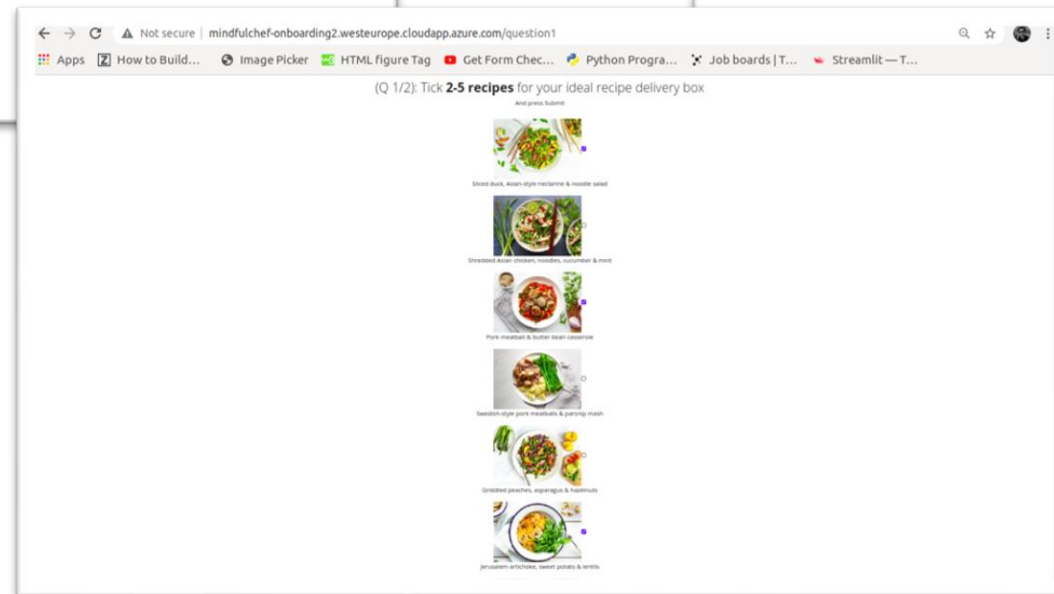
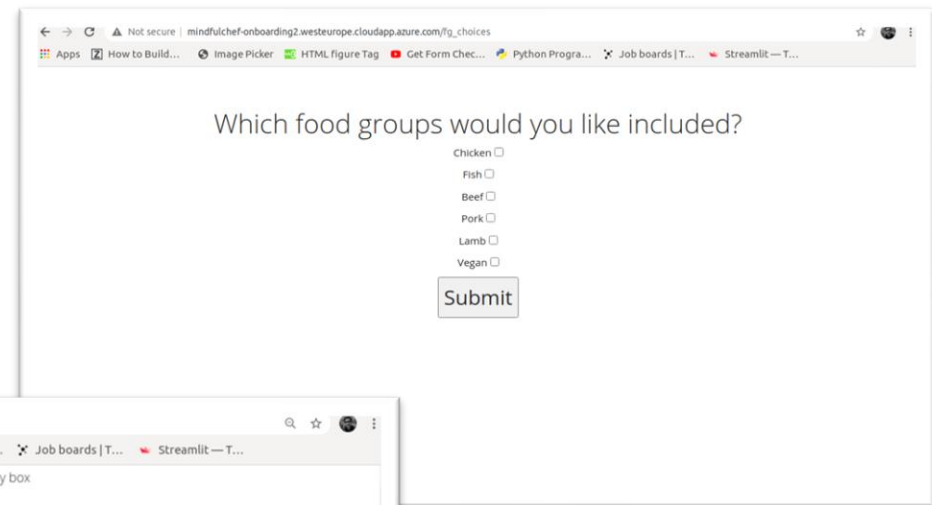
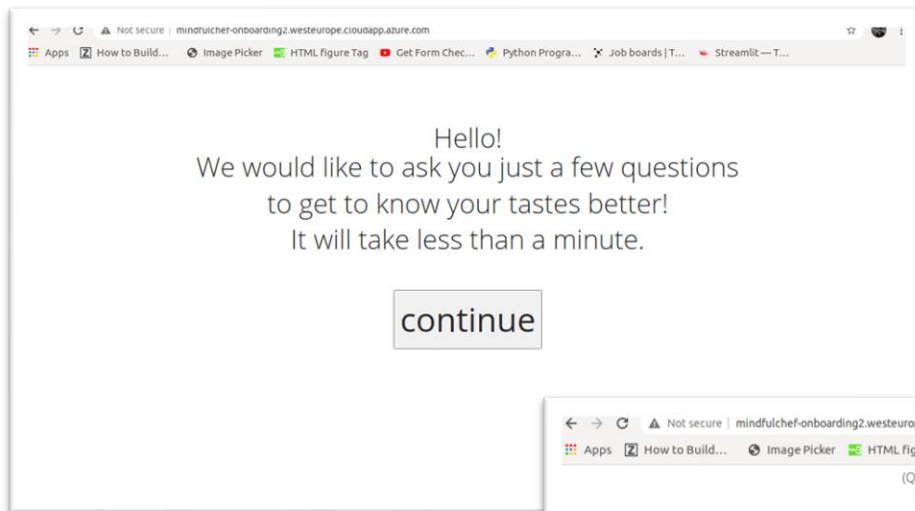
These 2 orders will reflect the percentages emerged during the initial stage of the game



Adventurousness
is served!

WEB APP DEVELOPMENT AND DEPLOYMENT





Received more than 11% responses per game in 3 days

A/B TESTING

EXISTING CUSTOMER



ACTUAL
ORDER
HISTORY



Distance =
Adventurousness

Time

EXISTING CUSTOMER

ONBOARDING
GAME



FAKE ORDER
HISTORY



Distance =
Adventurousness

COMPARE

TWO METRICS FOR ADVENTUROUSNESS

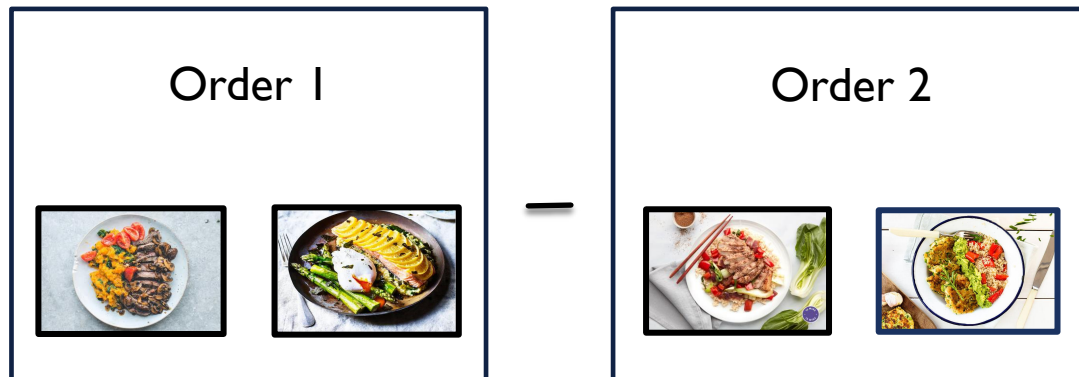
"Thai red tofu curry with wild rice"



Vector: (0.004, -0.013, 0.052, 0.011...)

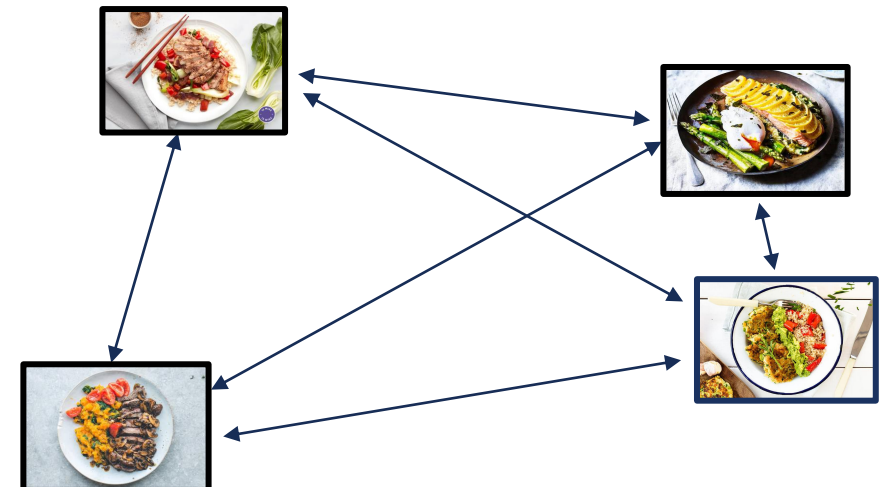
Delta I2

Mean of order 1 vectors - Mean of order 2 vectors

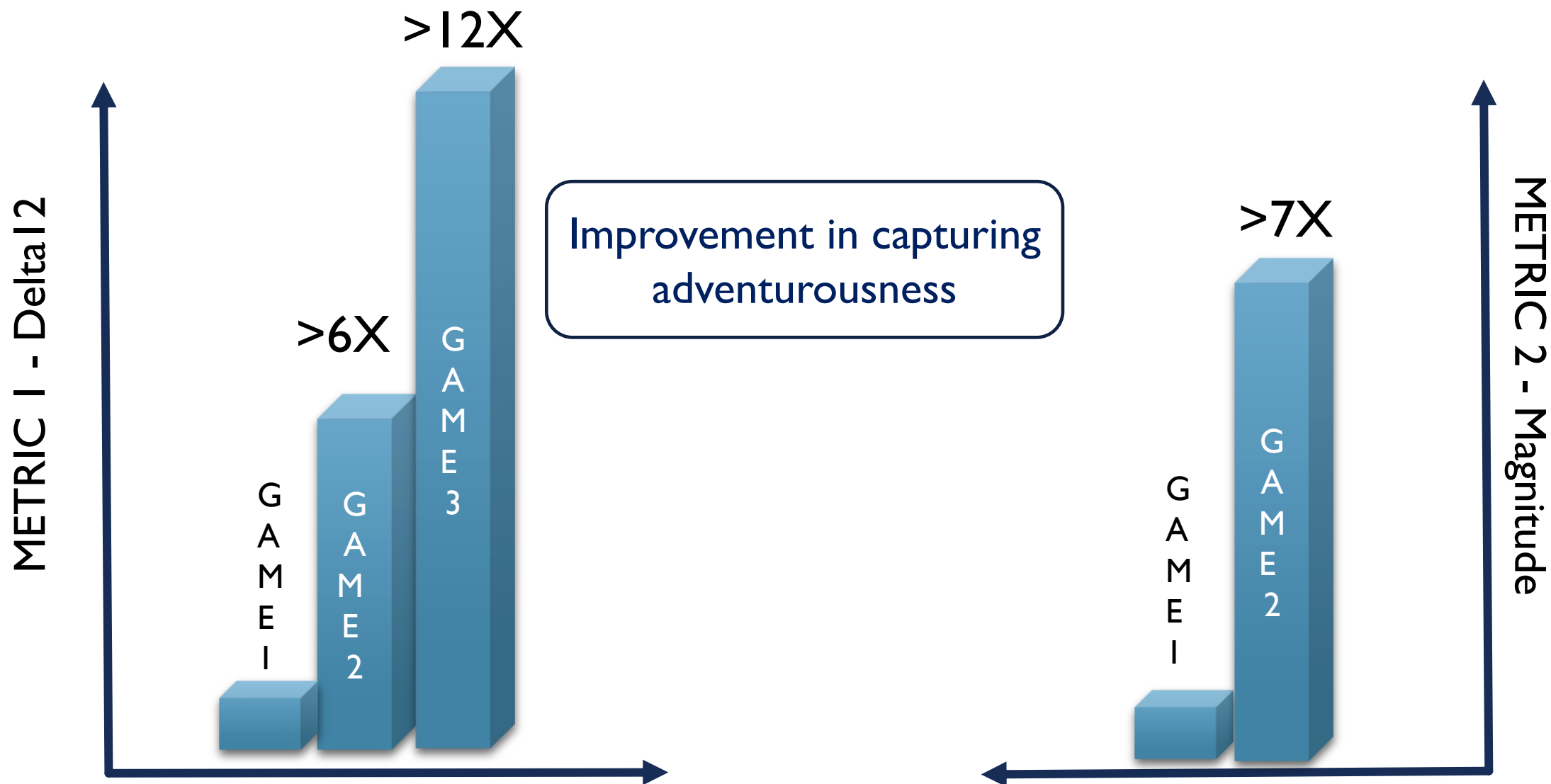


Magnitude

Mean of vector magnitudes between all chosen recipes



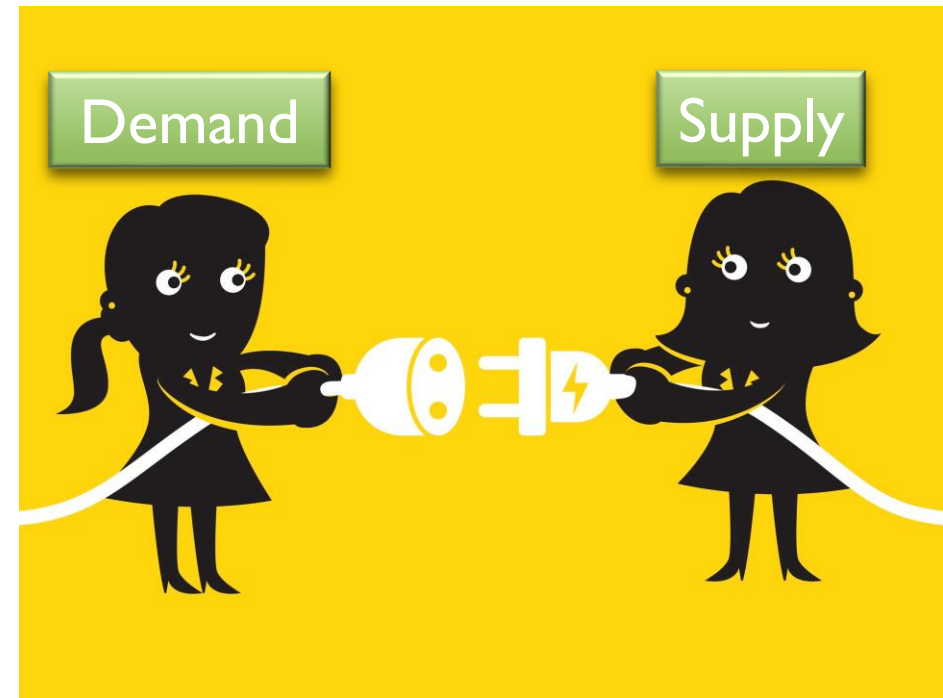
A/B testing results



COMMERCIAL IMPACT



Reduction of the
attrition rate



Improvement of forecasting
- less waste

Commercial impact

In the last 5 months
~58% of new customers
left the service after two orders

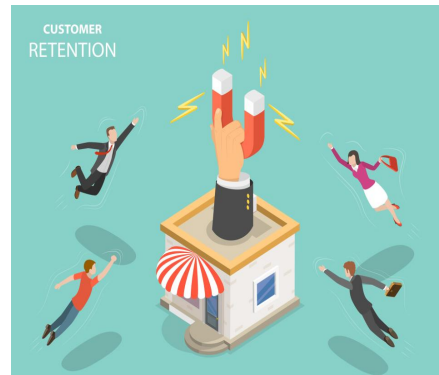


BUT...

onboarding
game



20% customers
could be retained



Assuming only one
order/month (£45)
per customer

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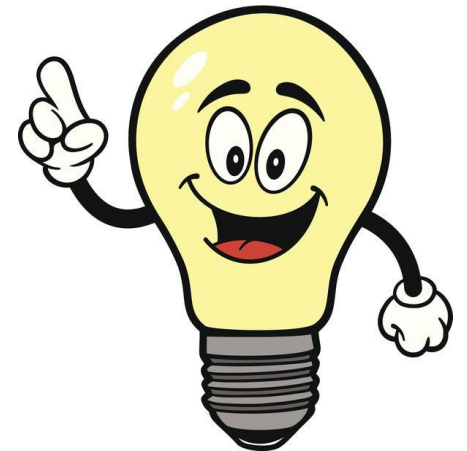
**£ 2.9
million
per year**

SUMMARY

- We developed 3 new onboarding tools: one reproducing the existing system, and two following a rigorous text analysis of the recipes
- All of the tools were made into a web App and deployed for A/B testing
- Each game was sent to 7000 customers, with a >11% response rate
- The two developed games showed a significant improvement in capturing adventurousness, compared to the baseline model
- Implementation of the onboarding tool could potentially increase the revenue of Mindful Chef to the tune of **£2.9m per year**

FUTURE INSIGHTS

- Further statistical analysis of the clusters to get better insights and interpretation
- Alternative metrics to compare game 2 and 3
- Use Multi-Armed Bandit method, such as the Greedy Epsilon Algorithm, to include a feedback loop on designing the questions
- A/B testing of finalized tool with actual new customers



It is said that the shortest path to reach a person's heart is through the stomach.
We hope we have helped Mindful Chef to make this path even shorter,
while enjoying their delicious meals 😊



We are hugely grateful to our mentor Andrius, as well as Rob, Jad, Wilson, Al and the rest of the team at Mindful Chef

Thank you also to Maryam, Kim, Jason and the rest of the S2DS group. We had a really fun time together as a team!!