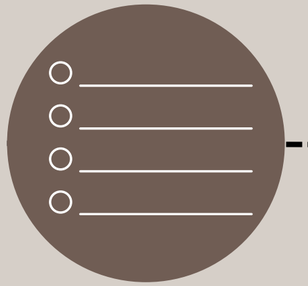
FASHION.AI

SIMILARITY &
COMPATIBILITY SEARCH
FOR USERS

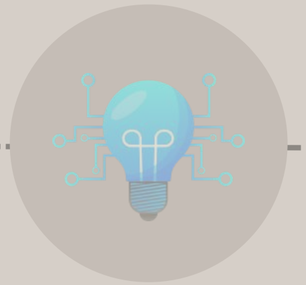
Kavisara
Jantarakolica

Agenda



Overall Backgound & Objectives

Datasets



Training

Web Application Development

Evaluation Method + Results

Conclusion

BACKGROUND

These days, many people have **2 main problems** when we talk about clothing.

1.) They find clothes they like, but they don't know where to buy them.

2.) They want to dress better, but they struggle with matching their clothing properly.

OUR SOLUTION

Fashion Platform (personal stylist) that can help users by

1.) Find similar clothing items for users

input image from user

output image from platform

2.) Suggest compatible fashion items for users

input image from user

output image from platform

TARGET CUSTOMER

Men & Women (Gen Z)
18-35 years
who love modern classic style clothing

People do not want to waste their time to find fashion product to buy

People do not know how to match their outfit on everyday look

OBJECTIVES

The compatibility score based on the suggested item generated by model should be **more than**

> 0.5

out of 1

The similarity score based on the suggested item generated by model should be **more than**

> 0.5

out of 1

The average score of 7 suggested outfit sets from the compatibility model that evaluate by sample group and fashion expert should be **more than**

> 4

out of 5

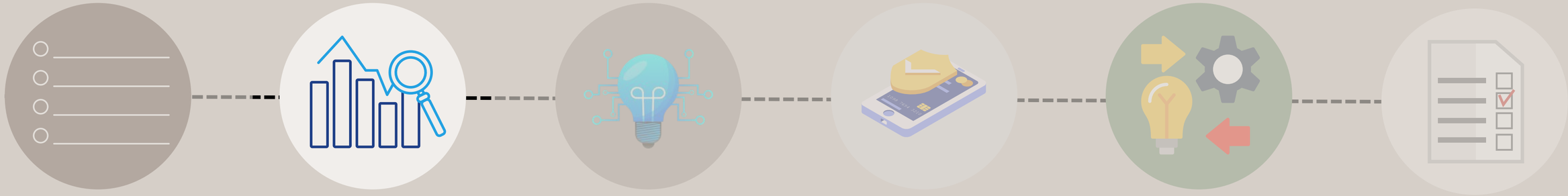
RESULT VERIFIED BY OUR FASHION EXPERT

P' June
Founder of
MaisonsKeep

P' Mind
Founder of
Gotcha_official

P' Boom
Founder of
Katia.sartoria

Agenda



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DATASET

Fashion32

13K outfits
40K items

Polyvore

60K outfits

Complete-the-look-dataset

100K outfits
453K items

Largest Dataset

IQON3000

308K outfits
672K items

detailed annotation for each data item

- categories
- Japanese website

Examples of uploaded oufit in iqon.jp

TRAINING DATASET

IQON3000

1. From 62 categories in dataset

2. Prioritize the categories that fitted into the **tops** and **bottoms**

3. Kept only outfits with **at least one top and one bottom**, resulting in

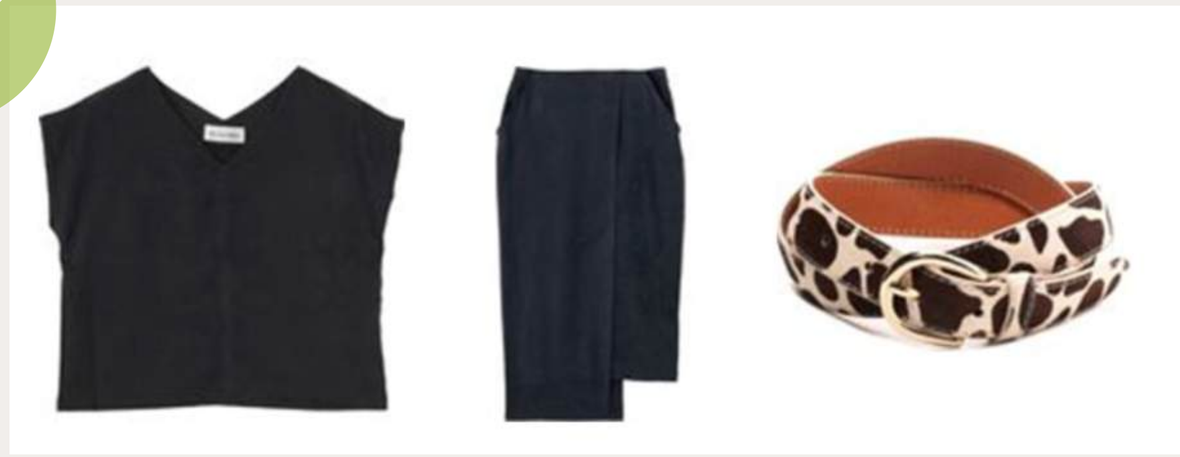
192,857 outfits

in training dataset

TRAINING DATASET

IQON3000

Incomplete outfit



A complete outfit contains at least

tops = ['ブラウス','チュニック','トップス','Tシャツ','タンクトップ','カーディガン','ニット']

bottoms = ['ショートパンツ','ロングパンツ','スカート','ロングスカート','レッグウェア']

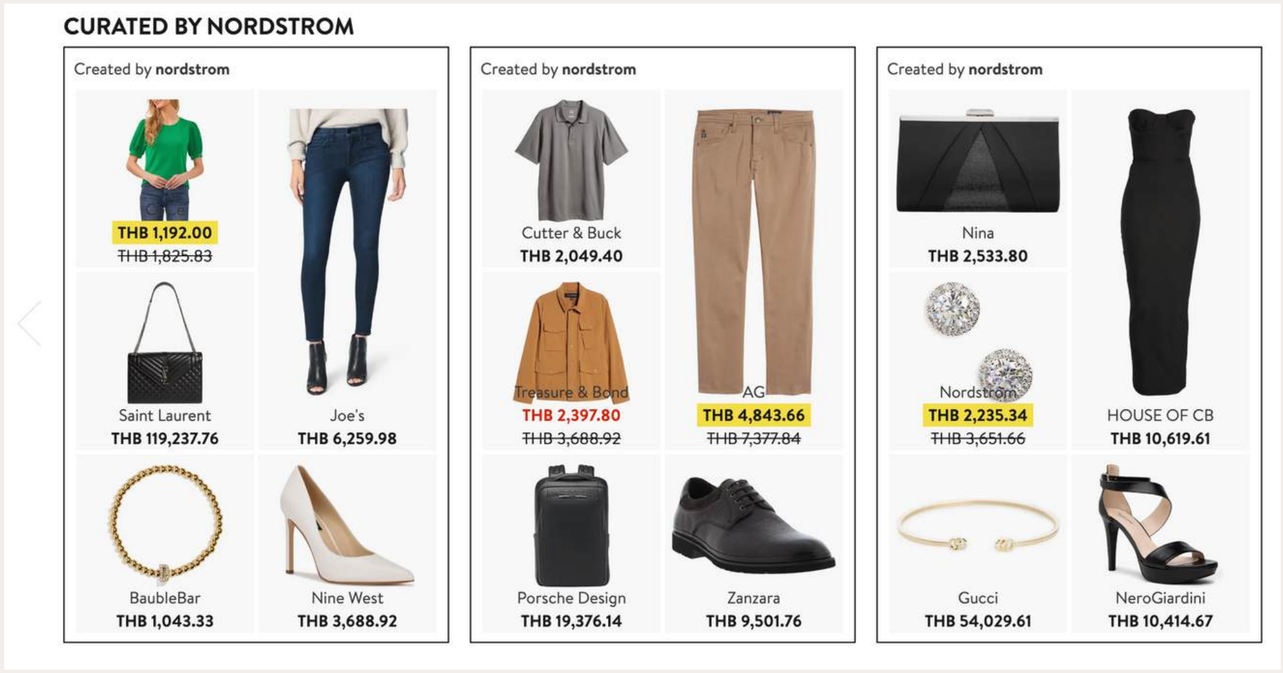
TESTING DATASET

scraped dataset
100 outfits

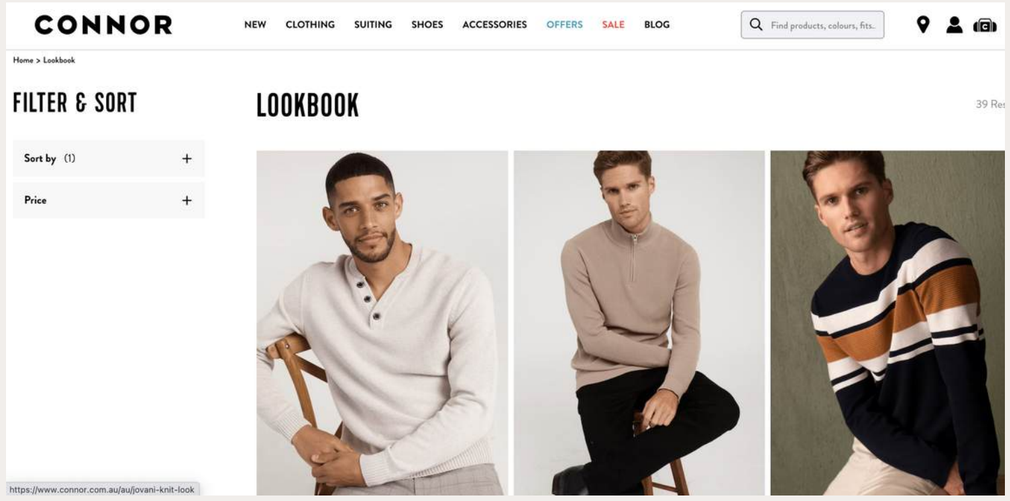
60 sets *of men's outfits*
40 sets *of women's outfits*

Each outfit set consists of the ***at least 3 mandatory parts*** *which are* ***top, bottom****, and* ***shoes***

and some outfit sets *also include* ***matching jackets, bags,*** *and* ***other accessories***



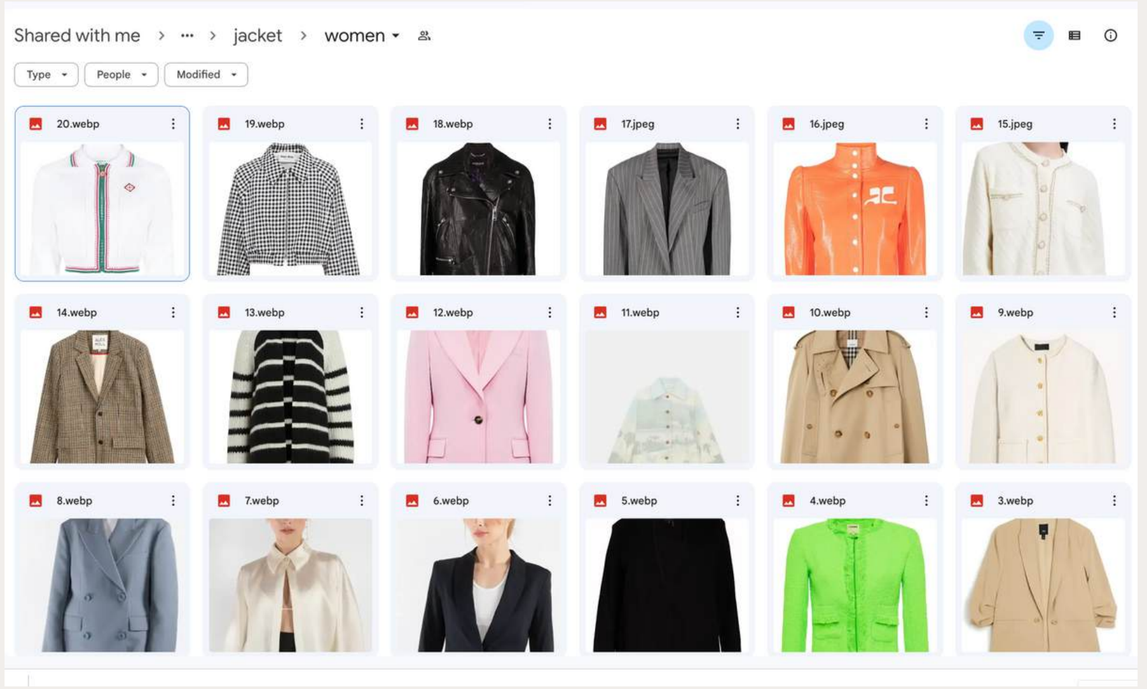
shop by look from real fashion websites

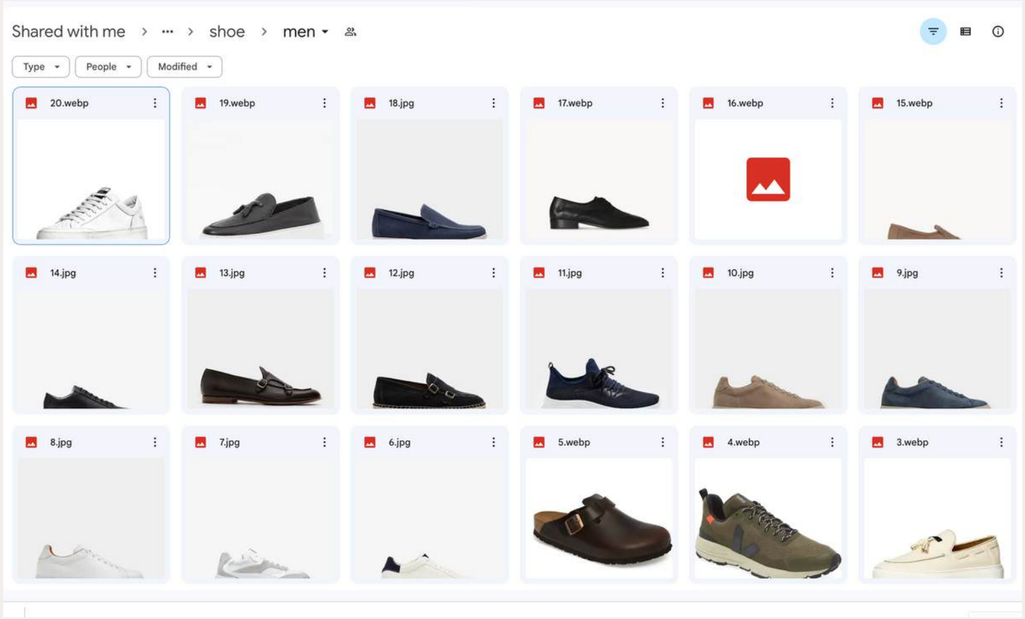


PLATFORM ITEM'S DATASET

used for web demonstration purpose

examples of platform's dataset



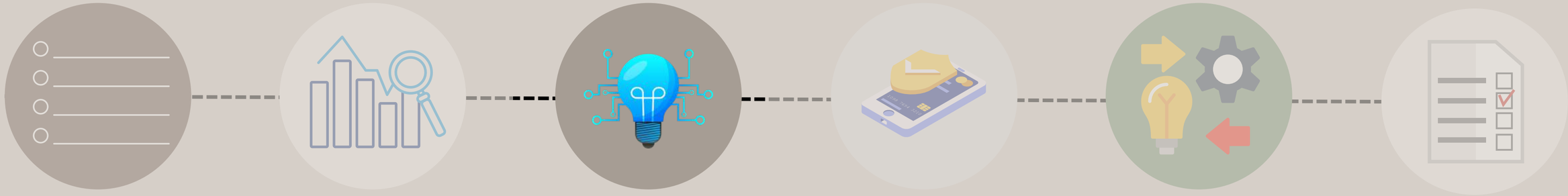


dataset categories

- accessories
- jacket
- bottoms
- tops
- bag
- shoe

388 items

Agenda



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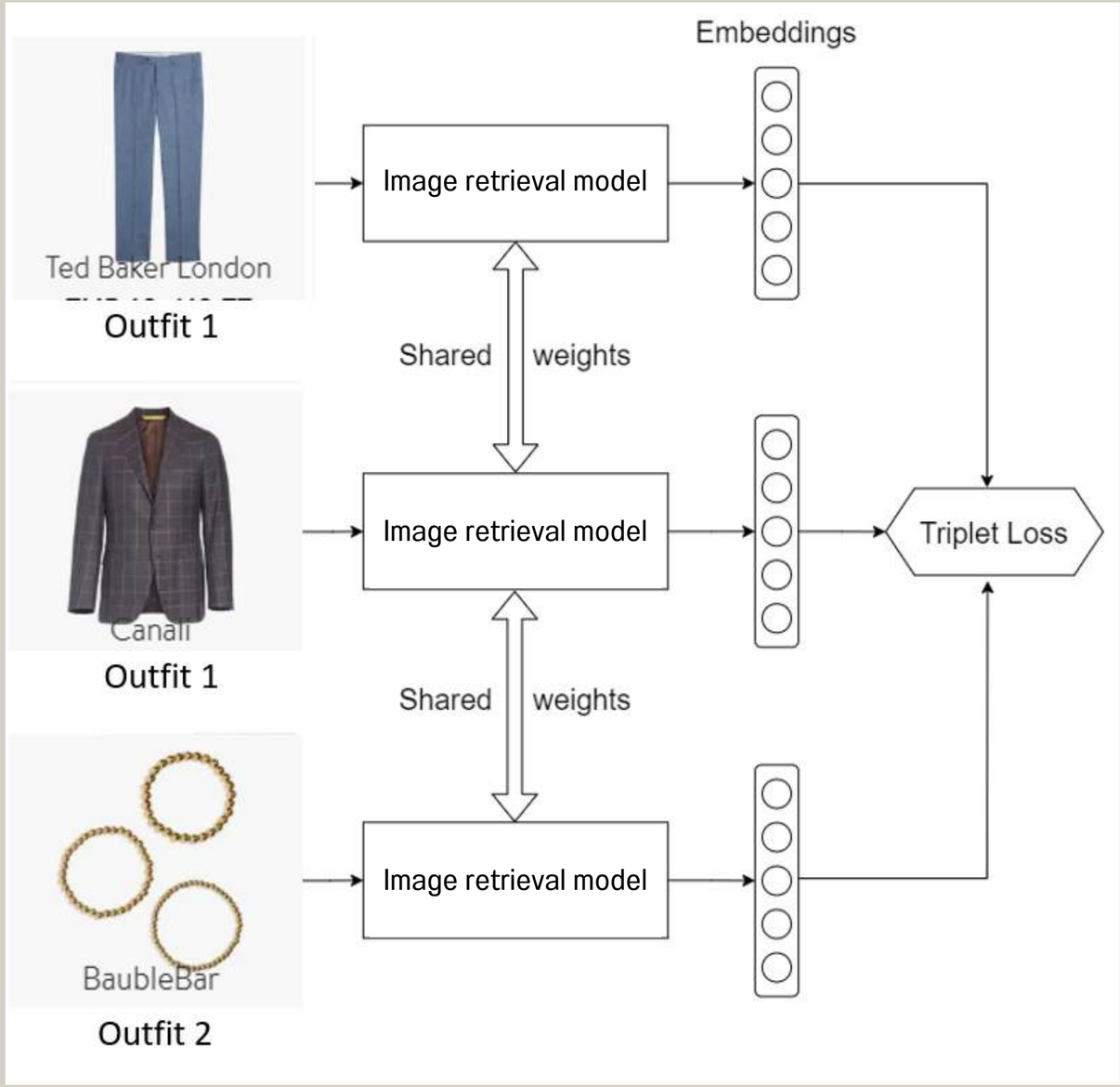
TRAINING

Retrained the previous semester image retrieval model with triplet loss



Training pipeline

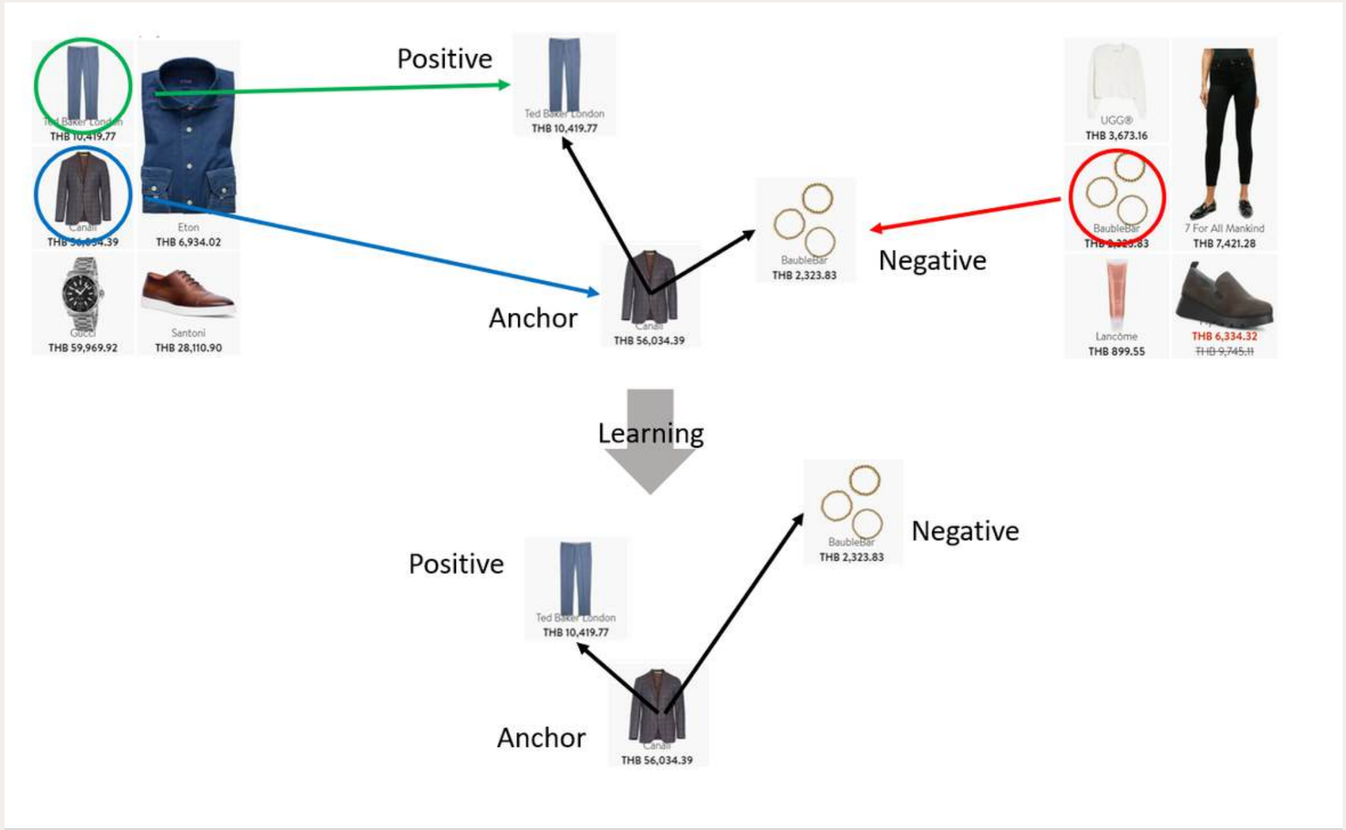


Illustration of triplet loss

Same outfit => Anchor & Positive

Different outfit => Negative

TRIPLET LOSS

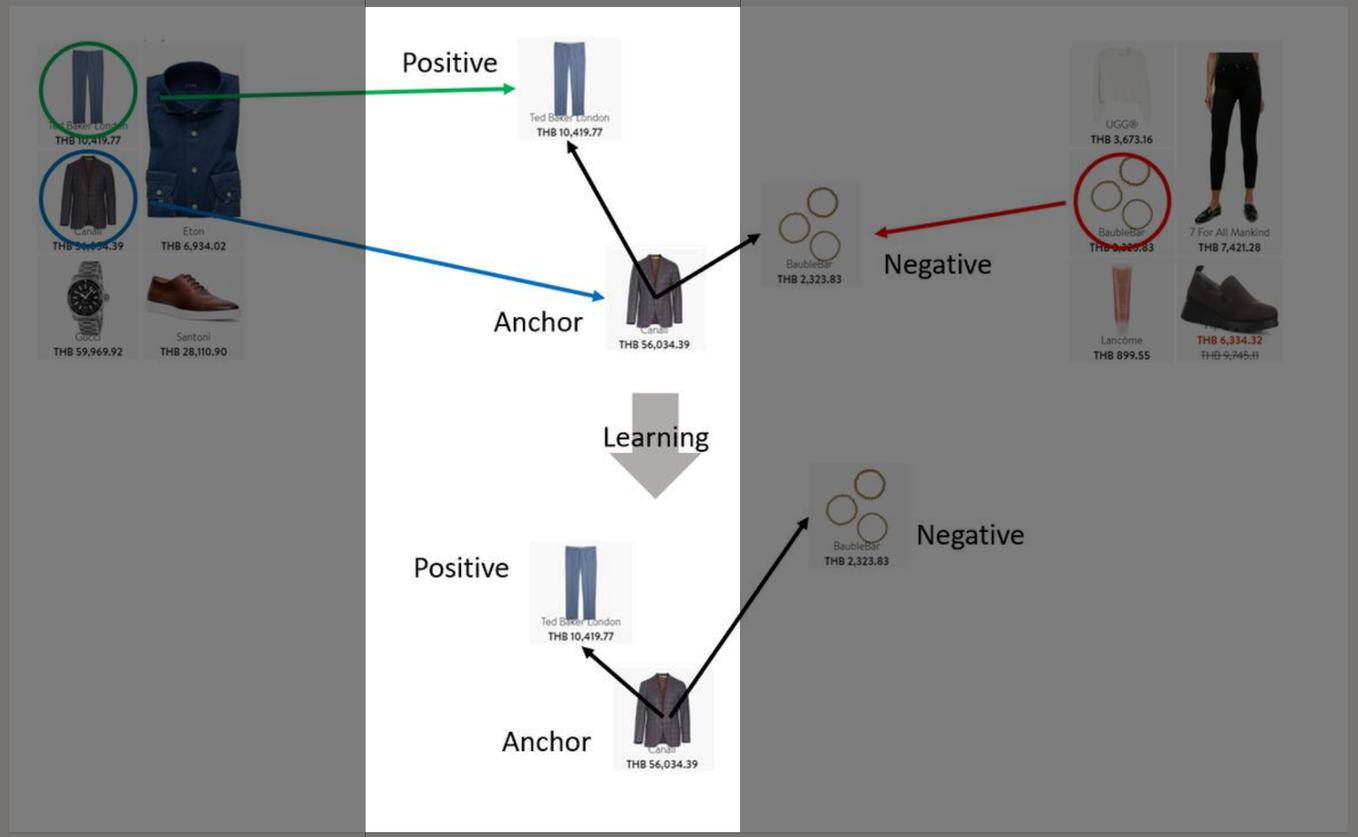


Illustration of triplet loss

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TRIPLET LOSS

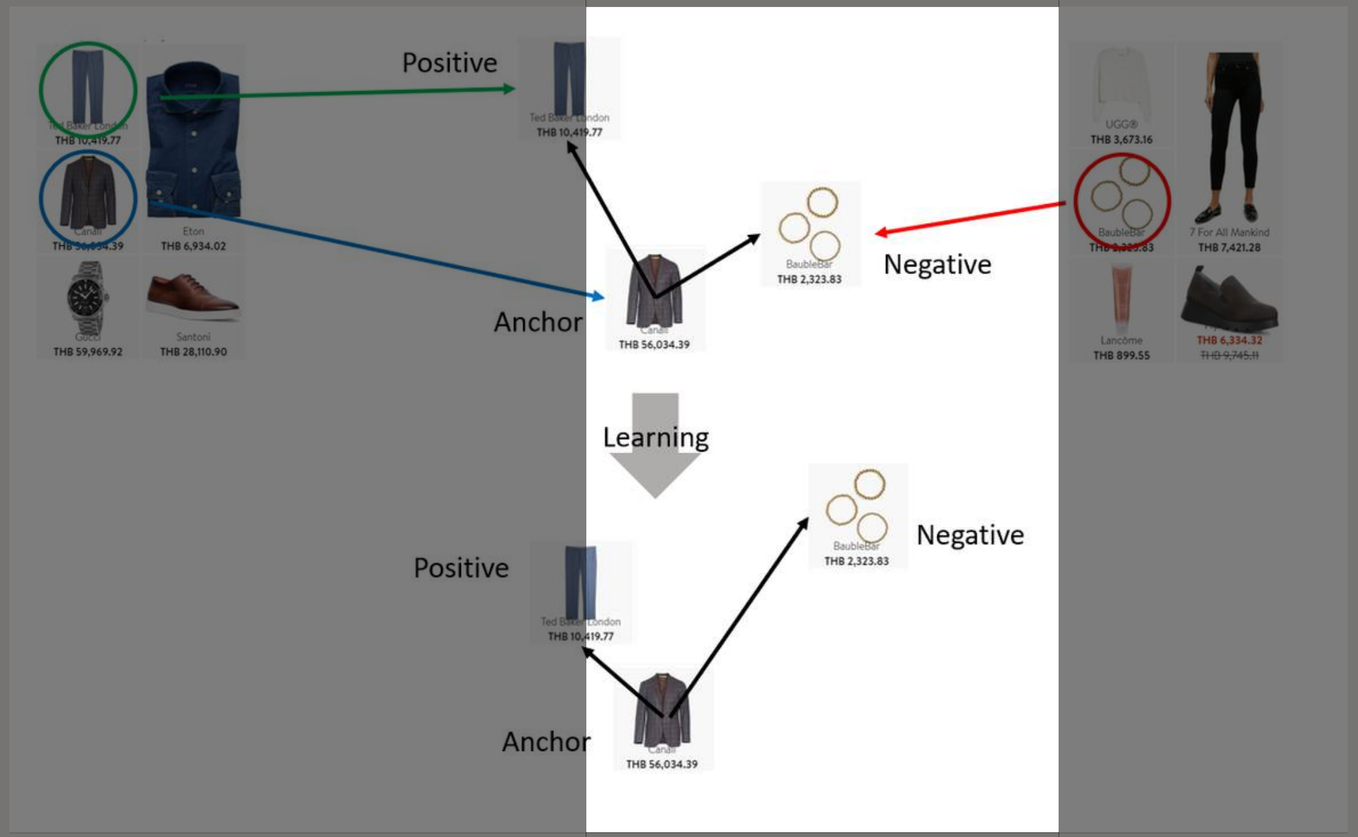

Illustration of triplet loss

Same outfit => Anchor & Positive

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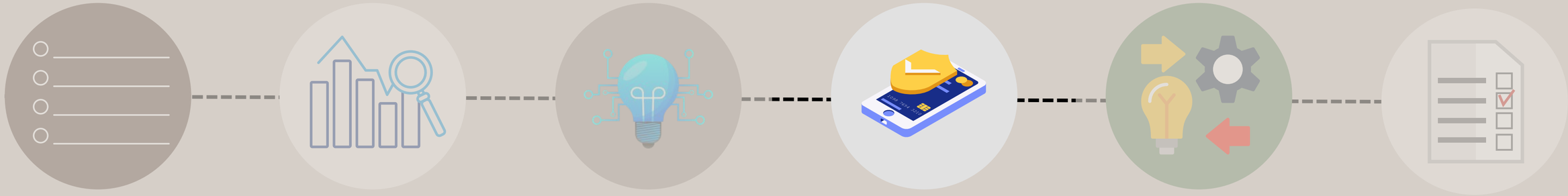
TRIPLET LOSS

Agenda



Overall Backgound & Objectives

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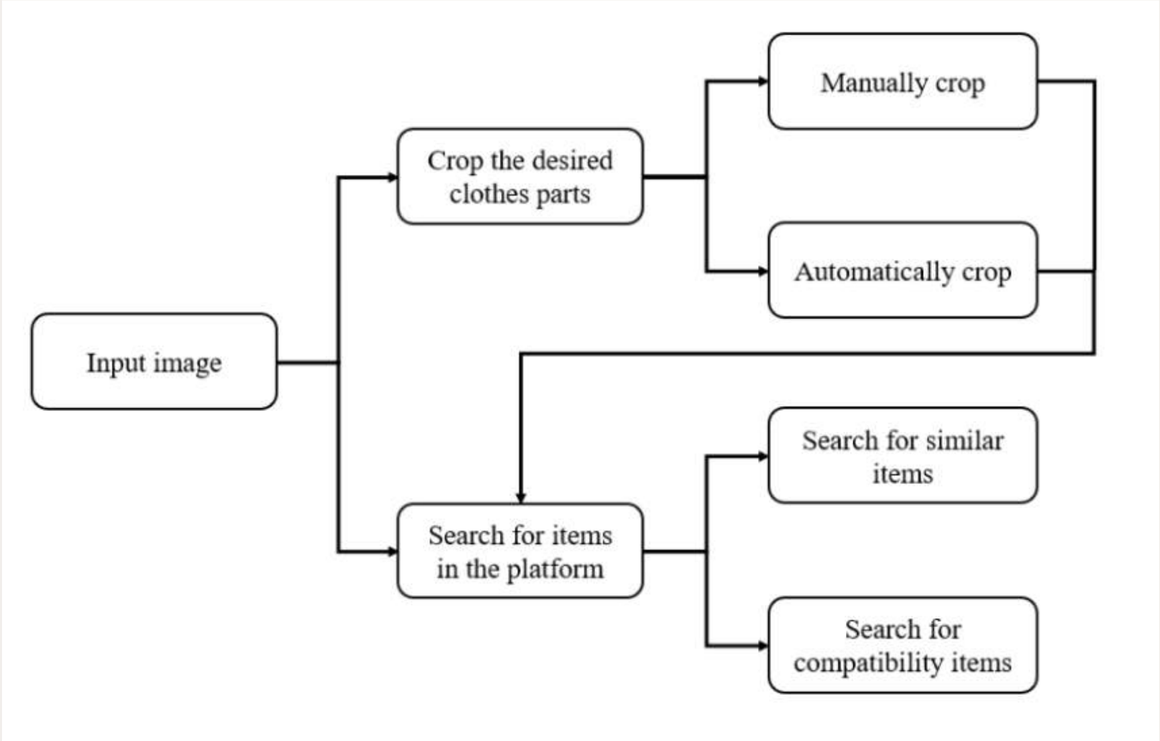
FRONTEND DEVELOPMENT

Example of frontend from the website

We combine **Web Development Technologies**

- HTML5
- CSS3
- JavaScript

BACKEND DEVELOPMENT



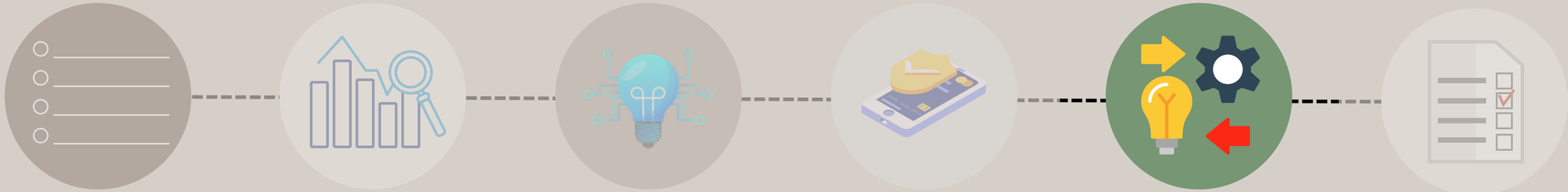
workflow of flask application

We use **Flask Web application** to combine our

- Python application
- Similarity search model
- Compatibility search model
- YOLO object recognition model

Flask allows people to use our models

Agenda



Overall Backgound & Objectives

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EVALUATION METHODS

Compatibility score ⟷ 1ST KPI

Outfit similarity score ⟷ 2ND KPI

Review by survey ⟷ 3 RD KPI

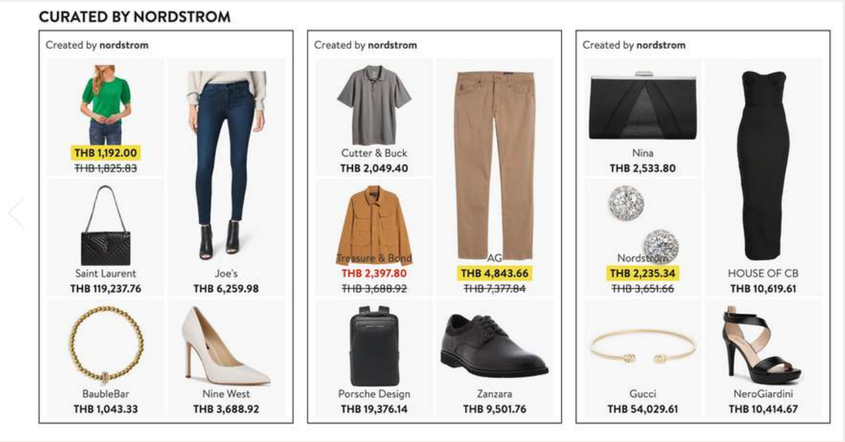
COMPATIBILITY SCORE

measures how many predicted compatible items are corrected

Evaluate with:

Training dataset

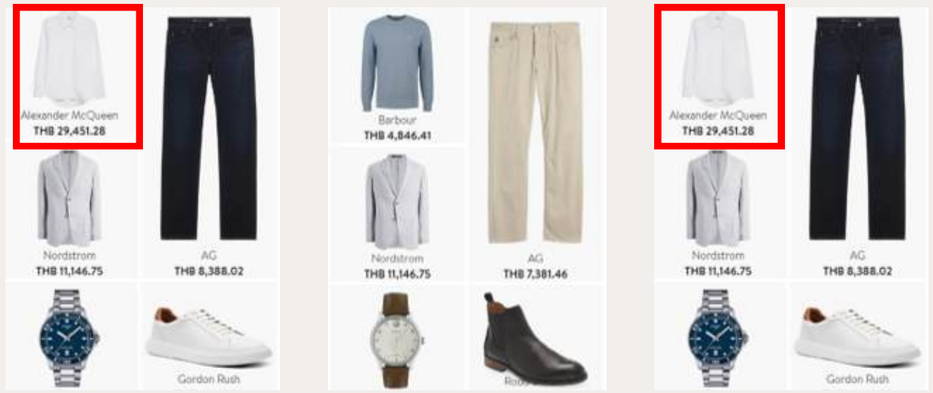
Testing dataset



COMPATIBILITY SCORE

Input image

Labeled compatible outfit



Predicted compatible outfit

Compatibility score = $\frac{\text{No. of items found in labeled outfit}}{\text{Total predicted items}}$

1st KPI

Evaluated dataset	Compatibility score
Testing dataset	0.2238

END RESULT

1st KPI

OUTFIT SIMILARITY SCORE

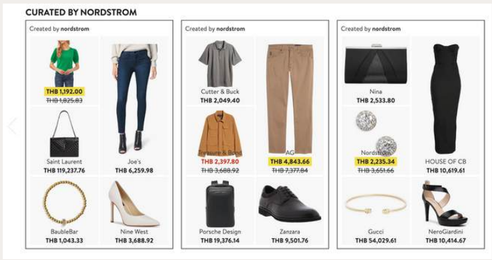
measures how similar the predicted items are compared to the items in same category in the dataset using cosine similarity

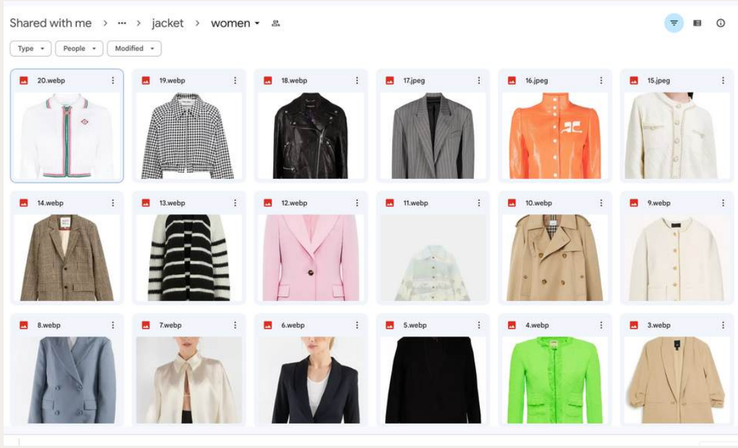
Evaluate with:

Training dataset

Testing dataset

Our platform item's dataset



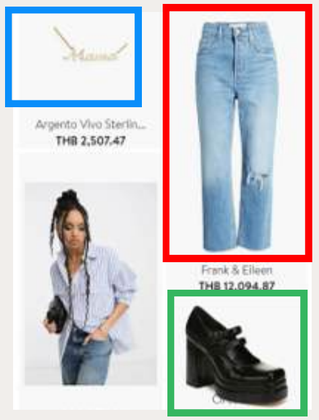


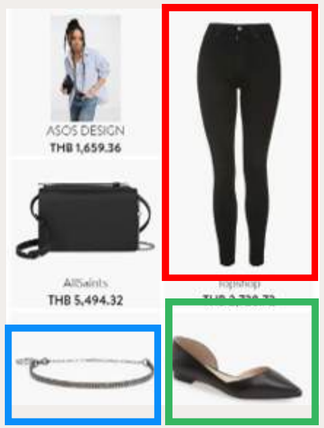
2 nd KPI

OUTFIT SIMILARITY SCORE

Input image

Labeled outfit





Outfit similarity score for each query example = Total outfit similarity score from each predicted items / Total predicted item

Predicted outfit

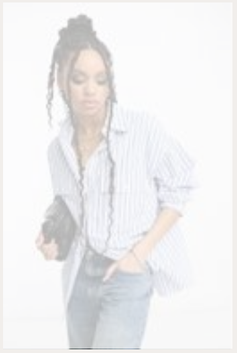
Outfit similarity score for each predicted item = Average Cosine similarity between item in labeled outfit & predicted outfit in same category

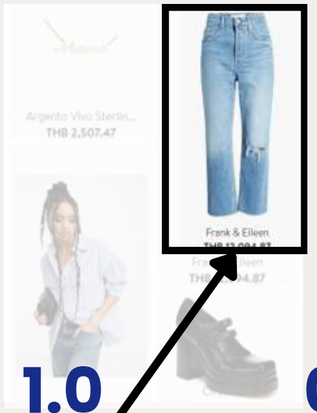
2 nd KPI

OUTFIT SIMILARITY SCORE

Labeled outfit

Input image





1.0

0.2

Measure Cosine Similarity

Predicted outfit

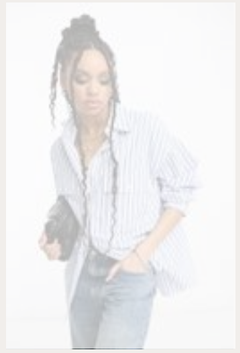
0.6

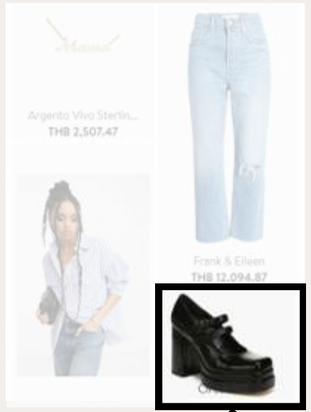
2 nd KPI

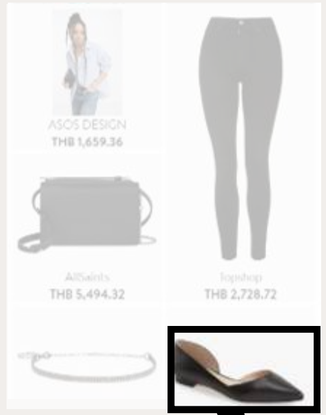
OUTFIT SIMILARITY SCORE

Labeled outfit

Input image







0.6

0.2

Measure Cosine Similarity

Predicted outfit

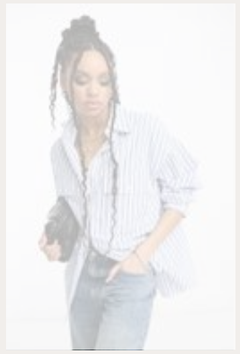
0.4

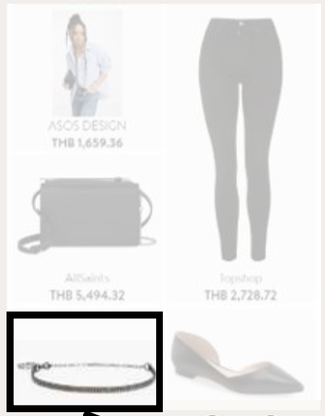
2 nd KPI

OUTFIT SIMILARITY SCORE

Labeled outfit

Input image





0.4

0.0

Measure Cosine Similarity

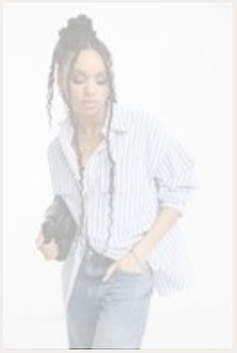
Predicted outfit

0.2

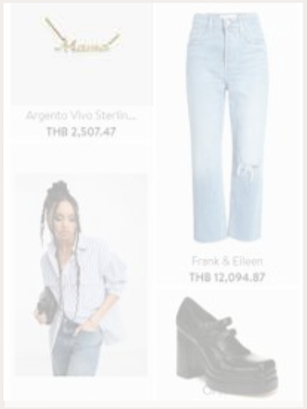
2 nd KPI

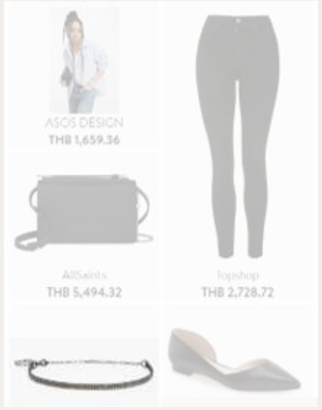
OUTFIT SIMILARITY SCORE

Input image



Labeled outfit





Predicted outfit

0.6

0.4

0.2

Total score = 0.3

2 nd KPI

Evaluated dataset	Similarity score
Testing dataset	0.7922

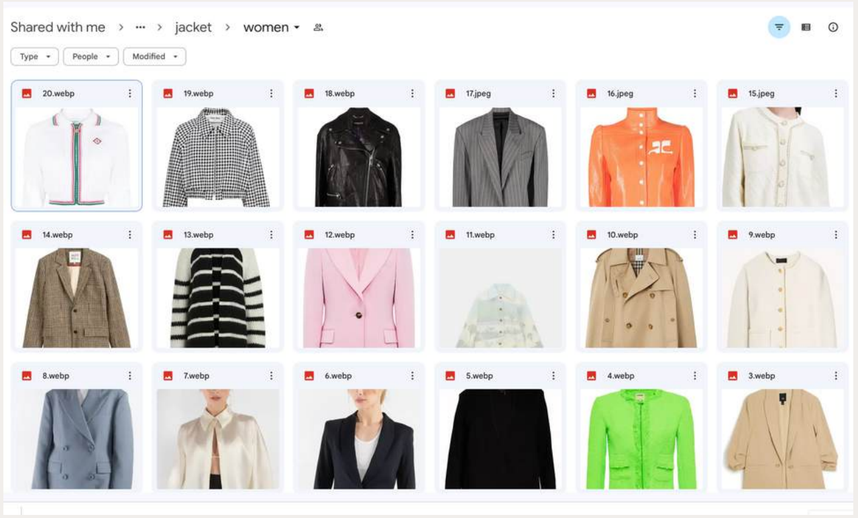
END RESULT

2 nd KPI

REVIEW BY SURVEY

measures how compatible the predicted items are
by 50 target customers and 5 fashion professionals

Input image : Our platform item's dataset



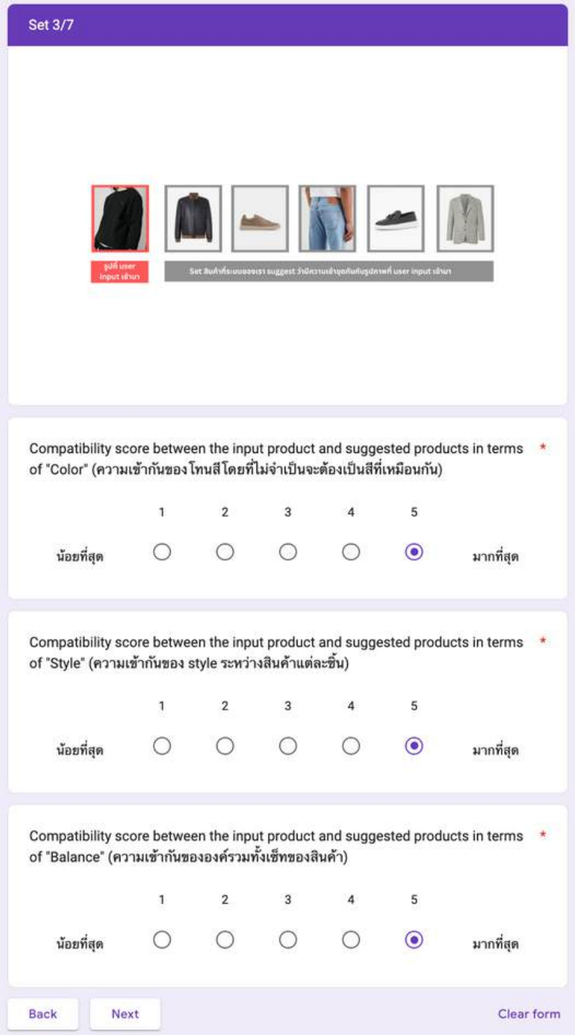
REVIEW BY SURVEY

7 sets of query examples for each gender

examples of suggested set in survey (MEN)

examples of suggested set in survey (WOMEN)

REVIEW BY SURVEY

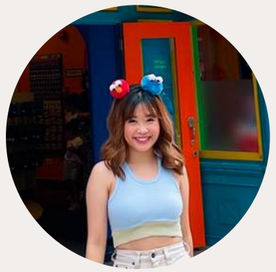


Criteria & Score weight

Color	30 %
Style	30 %
Balance	40 %

3 rd KPI

our target customers
18 - 35 years old who like modern classic style fashion



END RESULT

3 rd KPI

Average score of 7 suggested sets from compatibility model (full scale of 5)	
Sample group of customers	
Women	Men
4.193714286 / 5	4.044 / 5
4.118857143 / 5	

P' June
Founder of
MaisonsKeep

P' Mind
Founder of
Gotcha_official

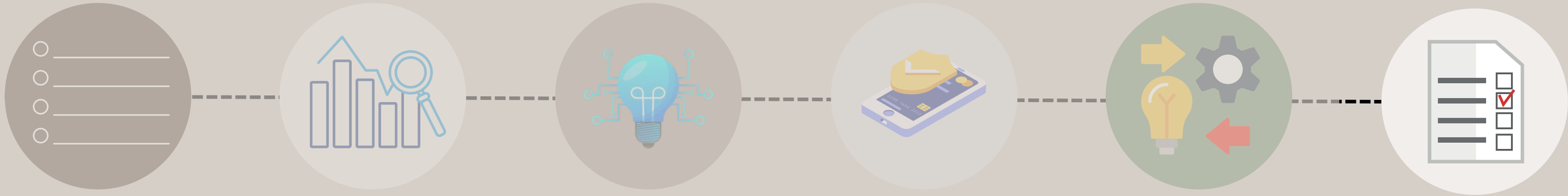
P' Patty
Founder of
Pacesoes

P' Boom
Founder of
Katia.sartoria

END RESULT 3 rd KPI

Average score of 7 suggested sets from compatibility model (full scale of 5)
Fashion professionals
4.3 / 5

Agenda



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RESULTS COMPARED TO KPI

The compatibility score	The outfit similarity score	The survey score
KPI Goals		
0.5/1	0.5/1	4/5
Results		
0.2238/1	0.7922/1	4.12/5 (Sample group of customer) | 4.13/5 (Fashion professionals)

END RESULTS

WHY KPI 1 NOT PASSED

Input image

Labeled outfit

Predicted compatible outfit

END RESULTS

LIMITATIONS

Noises in image

Database size

FUTURE IMPROVEMENTS

Incorporate user's feedback

Fine-tune the model by Thai people’s preferences data

Include user's identities for more personalized outfits

TIME FOR LIVE DEMO !

THANK YOU !

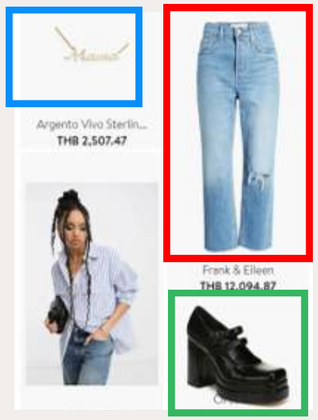
BACKUP

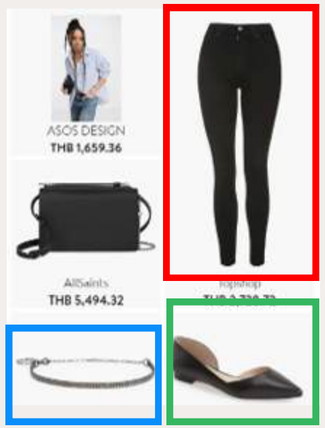
OUTFIT SIMILARITY SCORE

Input image

Similar image in testing dataset

Labeled outfit





Predicted compatible outfit

PLATFORM'S ITEMS DATASET SCORE

Evaluated dataset	Similarity score
Platform's items dataset	0.6834

TRANNING DATASET SCORE

Evaluated dataset	Compatibility score
Training dataset	0.3257

Evaluated dataset	Similarity score
Training dataset	0.7056