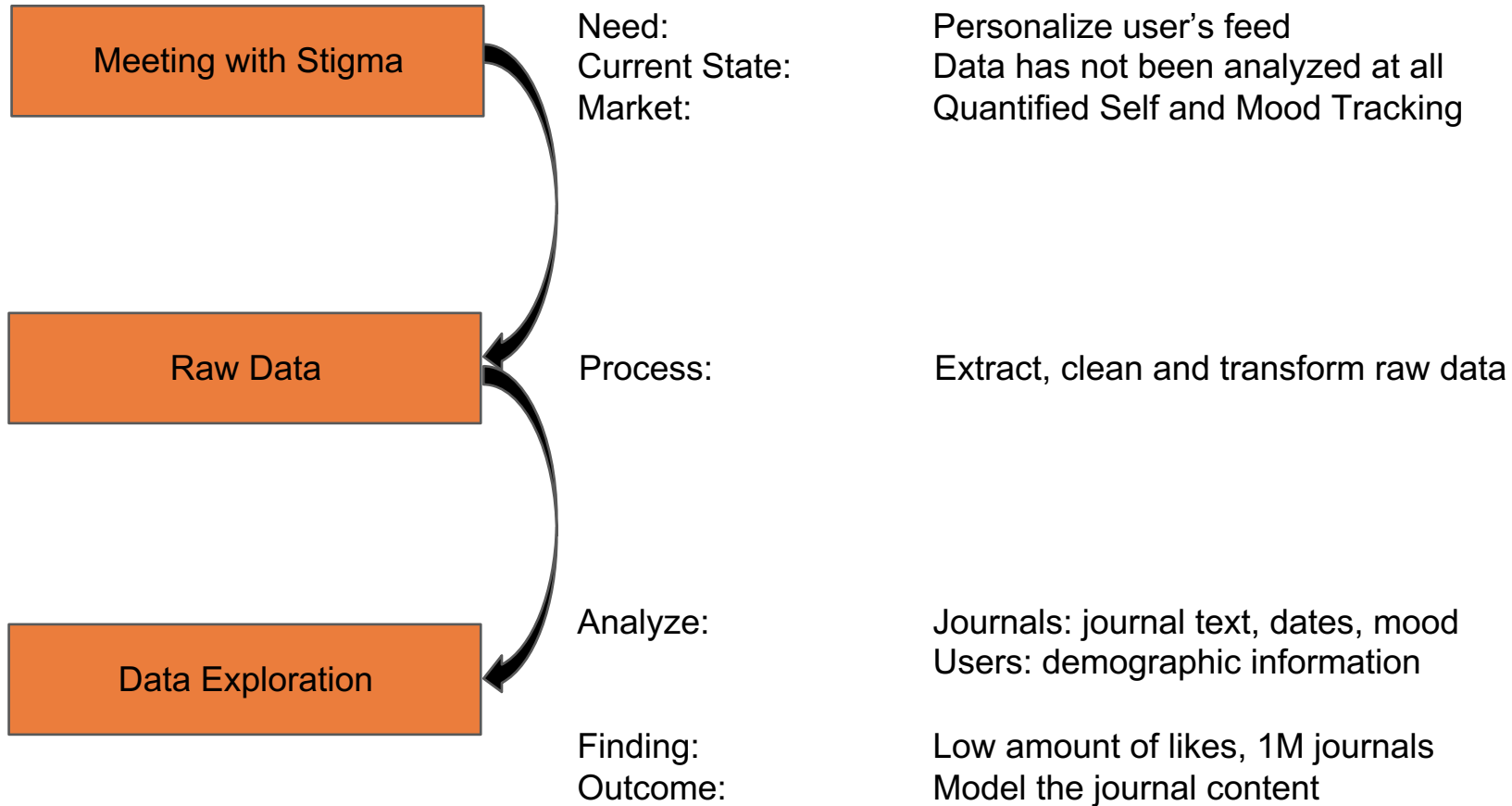


Quantifying the Human Experience

Anne Dawson • Baha Nurlybayev • Tazin Progga • Andy Toulis
Advisor: Dr. Lukasz Golab • Client: Kurt DaCosta, Stigma

Capstone Design Summary



Unsupervised Content
Based Design

Design:
Criteria:
Choice:

Based on utilizing content of journals
Interpretable, Scalable
Select Unsupervised Model

Topic Modelling

Objective:
Model:
Outcome:

Cluster journals based on word frequencies
Non-negative Matrix Factorization (NMF),
Latent Dirichlet Allocation (LDA)
Topics

Next Steps

Determine user preferences
Use journal topics and user preferences to make recommendations
Collect user feedback to tweak preferences

Non-Negative Matrix Factorization

Objective: Minimize Reconstruction Error of $(V - WH)$

Penalties: L1 and L2 Regularization of W, H

Constraints: Non-Negativity of W, H

V

Journals
x
Words

W

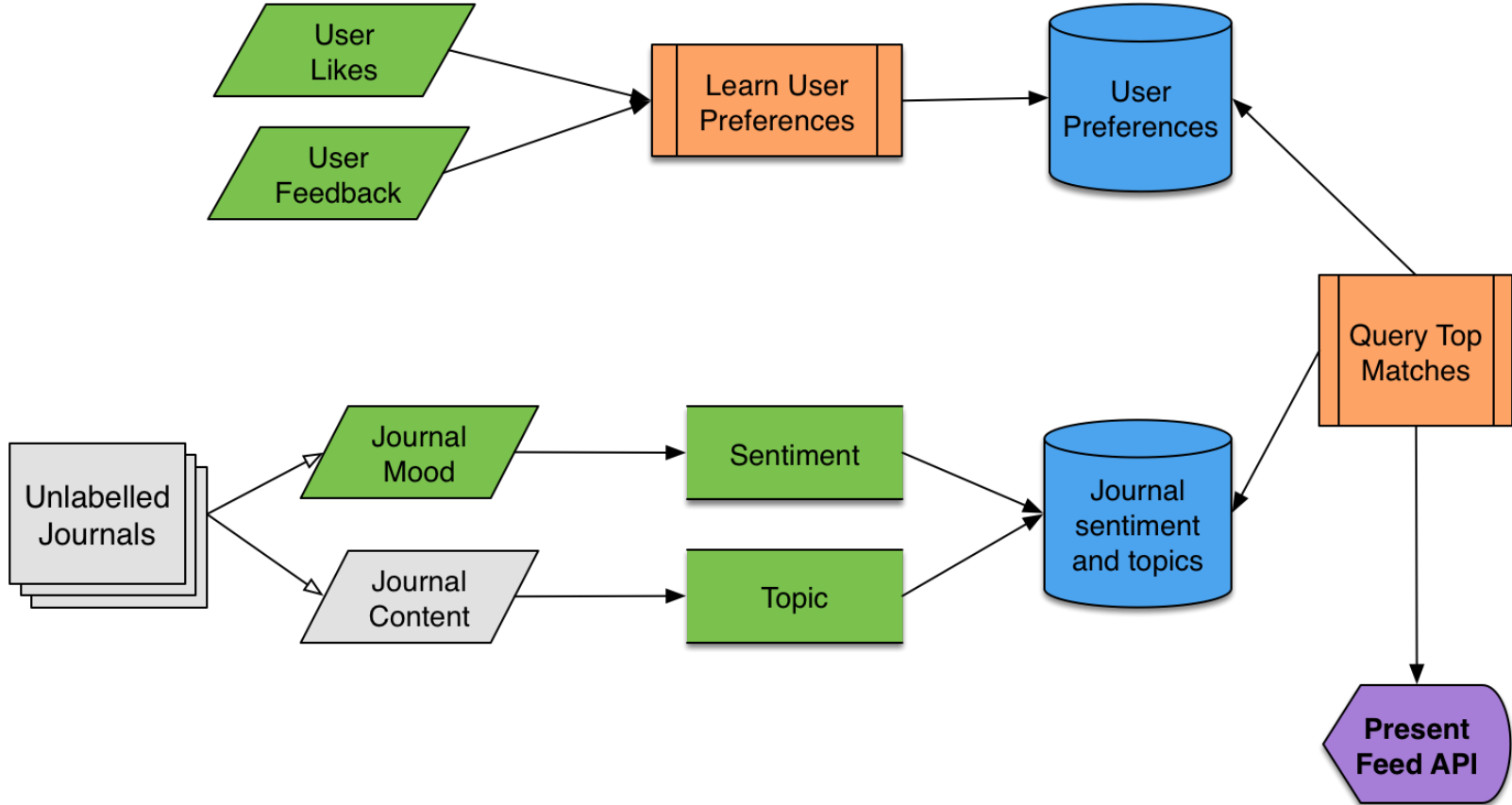
Topics
x
Words

\approx

H

Journal x Topics

Next Steps



Topic Modelling

Example

Tokenizing

“Happy love being around Jason.
We cooked breakfast and had an
amazing time at the party last
night. Everyone was
complimenting us. He is a such a
caring and kind boyfriend and
would make a great father for my
kids! Fingers crossed!!!”



Happy
love
being
around
Jason
We
cooked
breakfast
and
had
an
amazing
time
at

the
party
last
night
Everyone
was
complime
nting
us
He
is
such
caring
and

kind
boyfriend
and
would
make
a
great
father
for
my
kids
Fingers
crossed
!!!

Part of Speech Tagging

Hashtags: 'Happy', ''

Verbs: 'love', 'being', 'cooked', 'had', 'was', 'complimenting', 'is', 'would', 'make', 'crossed'

Proper Nouns: 'Jason'

Nouns: 'breakfast', 'time', 'party', 'night', 'Everyone', 'kind', 'boyfriend', 'father', 'kids', 'Fingers'

Adjectives: 'amazing', 'last', 'such', 'caring', 'great',

Pronouns: 'We', 'us', 'He'

Determiners: 'an', 'the', 'a', 'my'

Punctuations: '.', ',', '!', '!!!'

Conjunctions: 'and'

Pre-Post Position: 'around', 'at', 'for'

Lemmatization

Nouns & Verb tokens:

Lemmatized

love being cooked breakfast had
time party Everyone was
complimenting is kind boyfriend
would make father kids night
Fingers crossed



love be cook breakfast have time
party night everyone be
compliment be kind boyfriend
would make father kid finger cross

Feature Extraction

Nouns & Verb tokens:

love be cook breakfast have
time party night everyone be
compliment be kind boyfriend
would make father kid finger
cross

Preserved Tokens:

Love cook breakfast time
boyfriend party night compliment
father kid finger cross



Topic Classification

Journal:

#Happy love being around Jason.
We cooked breakfast and had an
amazing time at the party last
night. Everyone was
complimenting us. He is a such a
caring and kind boyfriend and
would make a great father for my
kids! Fingers crossed!!!



Topics:

- 1) Active Relaxation
- 2) Relationships
- 3) Party