SYSTEMS DESIGN ENGINEERING GROUP 10 AMBROSIA

Ambrosia

THE TOOL FOR BECOMING THE ULTIMATE INTUITIVE EATER

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PROBLEM

30 million

Suffer eating disorders in the United States

1 million

Meet the diagnosis criteria for eating disorders in Canada

In fact...

Eating disorders are associated with the highest rate of mortality among all mental health disorders.

Healthcare resources are expensive and prioritized for those with eating disorders

+

A lack of effective and widely available tools for those on the non-extreme end of the disordered eating habits spectrum

=

Need solutions that proactively prevent eating disorders

IMPACT

Social

- Empower individuals to improve their eating habits at their own pace and without the wait times of an overburdened healthcare system
- Encourage long-term behaviour change to help individuals live healthier lifestyles

Economic

- Alleviate demand on the healthcare system by proactively preventing development of eating disorders
- Reduce the costs associated with preventing eating disorders

OBJECTIVE

Design

A mobile application

to be used by

individuals exhibiting disordered eating behaviours who are ready to adopt change towards a healthier relationship with food

in order to

build IE habits resulting in long-term behaviour change and a persistent and positive relationship with food

What is Intuitive Eating (IE)?

A self-care eating framework based on physiological hunger and satiety cues rather than situational and emotional cues, created by two dietitians, Evelyn Tribole and Elyse Resch in 1995.

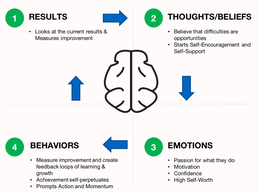
Eating Habits Spectrum

Intuitive Eating — Disordered Eating — Eating Disorder

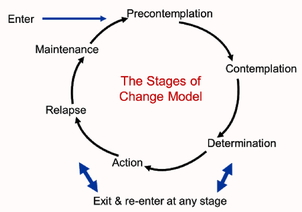
THEORETICAL FRAMEWORKS

To scope our target users, theoretical models were considered:

Growth Framework



Growth vs. Fixed Mindset
by Carol S. Dweck



Transtheoretical Model
by Prochaska, DiClemente & Norcross

Using Michael Hyatt's principle of the **Three Big Wins** and the **Pareto principle**, we develop the structure of our product:

- 2-5 daily tasks over
- 12-16 weeks

To keep users motivated and engaged, we design for Albert Bandura's construct of **Self-Efficacy** — addressing intrinsic motivation — and Fred C. Lunenburg's **Goal-Setting Theory of Motivation** — addressing extrinsic motivation

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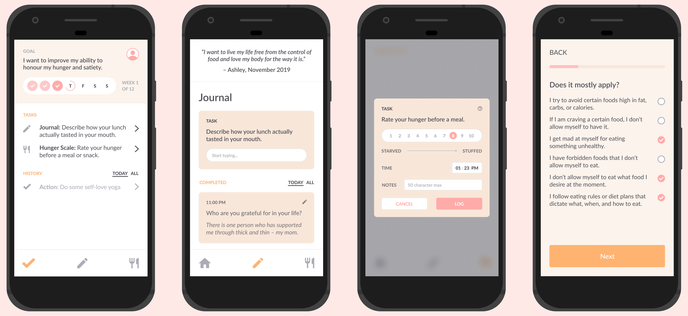
DESIGNED SOLUTION

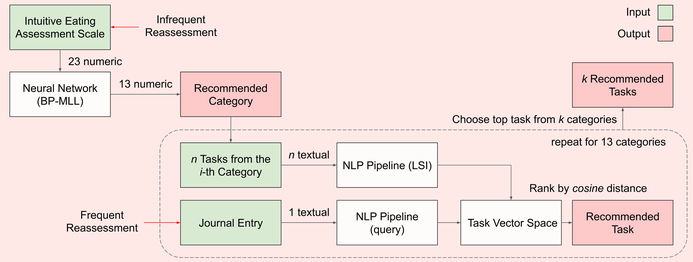
An intuitive & friendly experience



Tasks — Journal — Hunger Scale — IEAS*

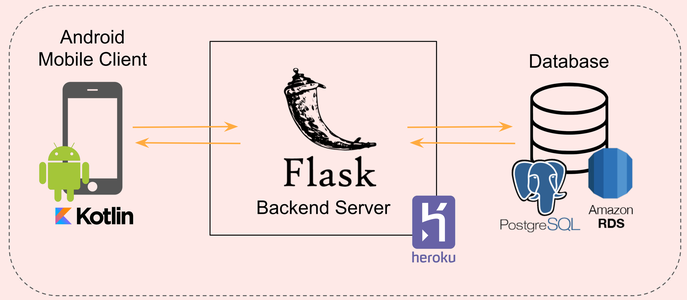
MACHINE LEARNING

A tailored journey for each individual



SOFTWARE

A convenient mobile solution



*IEAS = Intuitive Eating Assessment Scale adapted from Tracy Tylka

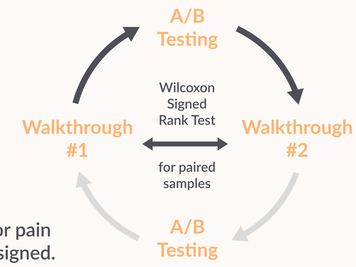
CONCLUSIONS → RECOMMENDATION

1. The 5-second test proved that the product was warm and friendly.
   - Improve the first time user experience with educational tooltips and seamless transitions
2. Usability testing showed that the use of the hunger scale is still the most confusing part of the product.
   - Simplify the interaction of the hunger scale and reconduct tests
3. The product lacks an educational component for users who want to dive deeper into intuitive eating.
   - Personalise the home screen with tips/words/quotes of the day to motivate and educate the user

RESULTS

VERIFICATION

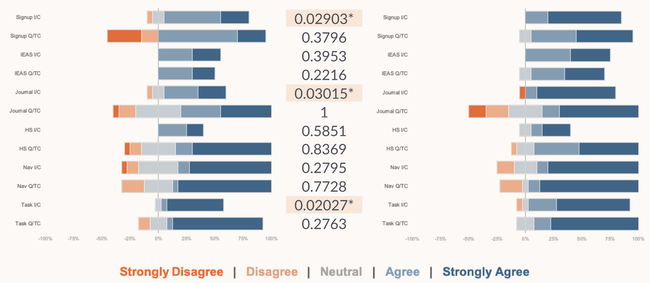
Usability Tests



- 20 volunteers were asked 12 questions (Likert Scale) probing usability after participating in the first **cognitive walkthrough**.
- From the walkthrough, 8 major pain points were identified & redesigned.
- 20 different volunteers participated in **A/B testing**. Results were tabulated to determine which of the 8 redesigns will be implemented for the follow-up cognitive walkthrough.

Feature	Original	Redesign
Login	4	16
	1	19
IEAS Checkbox	6	14
IEAS Results	19	1
Headers	17	3
	19	1
Completion	2	18
History	14	6
HS Label	1	19
Task Repetition	13	7

- The first 20 volunteers were asked to return and participate in a second **cognitive walkthrough** with the redesigns implemented.
- The paired results were analyzed with a **Wilcoxon signed rank test** with continuity correction.
- p-values reported below:

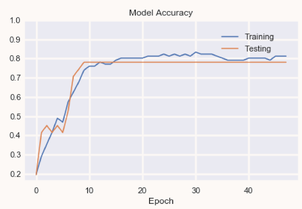


Machine Learning

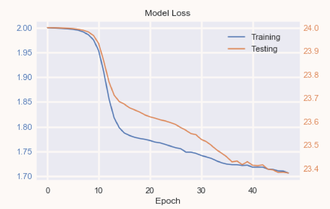
For the **neural network**, we present the training (n=96) and testing (n=24) **accuracies** as well as **loss** in both graphical and numerical (max/min over epochs) forms:

For the **natural language processing** pipeline, accuracy is quantified in 2 ways:

By category (n=13): 92.3%
By task (n=65): 61.5%



Training accuracy: 83.33%
Testing accuracy: 75.00%



Training loss: 1.71
Testing loss: 23.38

Software Unit tests & integration tests ensure software functionality

VALIDATION

State Measures

20 volunteers were asked 5 questions (on a Likert Scale) probing state measures via a post-pre survey. The results were analyzed with a Wilcoxon signed rank test with continuity correction. p-values reported below:

Understanding	Commitment	Confidence	Strategies	Opportunities
0.1489	0.004764*	0.01966*	0.001222*	0.01766*

*Statistically significant (p-value < 0.05)