

# Research and writing portfolio

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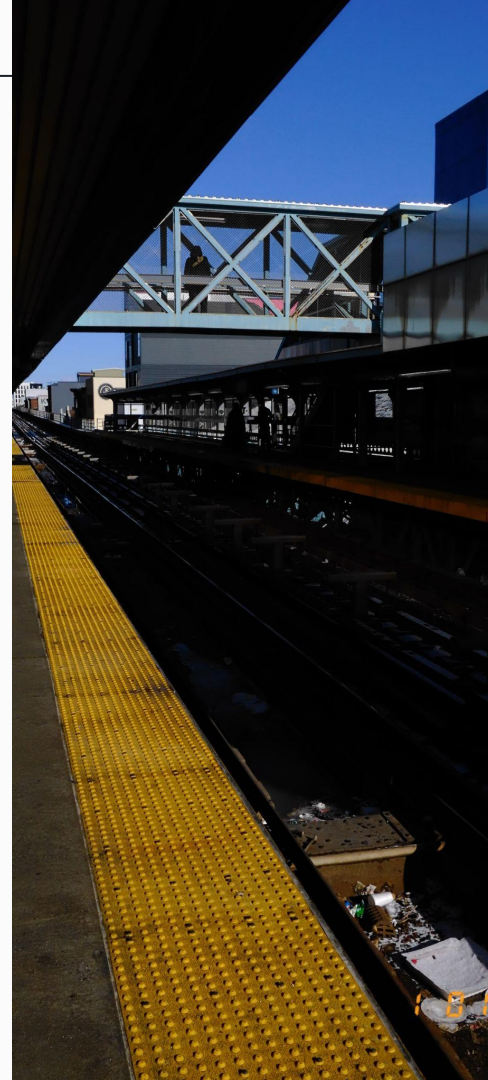
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*Usability testing; Microcopy evaluation; Tree testing; Information architecture*

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User reactions to business model changes (MAU/DAU)

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# User reactions to business model changes (MAU/DAU)

## The client

**Udacity:** A Massive Open Online Course program aspiring to make access to high quality coding and technology tutorials equitable and profitable

01

### Context

Since launching in 2014, Udacity amassed a large, devoted user base. However, in 2015, Udacity rolled out a new 'freemium' business model, with both free and paid content.

02

### Issue

How does this change in business model affect user behavior?

03

### The ask

Track usage statistics in the months following the change to the business model, including:

1. Course completion
2. Number of courses attempted, and
3. Projects completed

Use social listening channels to identify pain points and opportunities in the learner's own words

Identify our user groups and define targeting priorities



# Report on Udacity daily engagement dataset

(<https://www.kaggle.com/datasets/austenmy/udacity-daily-engagement>)

## Assumptions and meta information

1. The following is a report on a published event-based user behavior dataset from 2015 (prepared for this portfolio)
2. The dataset contains records from a few months after Udacity changed its business model from 'free' to 'freemium'. As best I could, I based storytelling and recommendations around the product *as it had existed in Q4 2014 through 2015*.
3. However, screenshots of the product are from 2026.
4. External references, like quotations, are not confined to pre-2016.
5. Big caveat: Current Udacity customers are *not defined explicitly in the dataset*. Instead, customers are defined here by evidence of project completion, which requires a paid subscription. The number of Customers is likely an underestimate. The actual number of customers in the dataset is unknown/unknowable from what information was provided.
6. Finally, notes *about the presentation itself* are presented in figures like the one here:



This is a comment about the presentation itself / my thought process

# Udacity

## State of the user



## Summary of key findings

Udacity just switched from a 'free' model to a subscription-based 'freemium' model betting that access to experts (project evaluation, help with material, pacing guidance) would justify this change.

### The good

- 1/ **Monthly Active Users is up:** MAU has almost doubled in the past 9 months for Customers, specifically; MAU increased among non-paying users since March 2015. The switch to a 'Freemium' model has not hurt our MAU.
- 2/ **We have a great product:** Most users spend hours on our platform and complete dozens of lessons, suggesting they know our product well and value the education it provides. We're sticking to our lofty educational goals and people are noticing.

### Where to improve

- 1/ **Caught up in free samples:** Our biggest hurdle is the "why buy?" mentality many free users have (and potentially customers, too!) Users know our content is great, but need a push to subscribe to customers-only perks.
- 2/ **Revolving door student body:** MAU among Customers has steadily declined since March, 2015 (though still up overall from Nov '14), and 'Stickiness' (the proportion of Daily Active Users to MAU) has steadily declined for this population over this 9-month period. 'Stickiness' for other user segments is consistent, but low.

Our monthly-subscription model may financially penalize long-tail engagement among Customers and scare away free users.

# Roadmap

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1/

## Our product

- Change in business model
- Introducing Nanodegrees
- Framing the question: How is our User base evolving?

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2/

## Usage statistics

- Monthly average users, stickiness
- Usage by segment

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3/

## Our Users, in detail

- Introducing our user segments
- Explorers & Dabblers
- Avid Learners & 'Freemium' Pros
- Customers

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4/

## Reflection

- Revisiting usage statistics
- Summary of findings
- Next steps

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5/

## Appendix

- User comparison chart
- Data preparation
- Variables used, engineered
- Details of cluster analysis

# We rolled out some big changes in 2014

We expect our students and customers to react

## 'Free' model

Q2 2014 and earlier

- ✓ Course access
- ✓ Quizzes / activities
- ✓ In-class projects
- ✓ Certificate of completion

## 'Freemium' model

Q3 2014 - present

- ★ ✓ Course access, new courses added
- ✓ Quizzes / activities
- In-class projects
- Verified certificate of completion
- ★ Project feedback and code reviews
- ★ Personal guidance from a coach
- ★ Personalized pacing support

★ = new feature  
✓ = free component

# Our stand-alone courses are now reorganized into Nanodegrees for subscribers

Non-subscribers have access to select individual courses

The screenshot displays the 'Program Outline' for the 'Data Analyst Nanodegree Program'. At the top, it shows '5 courses', '20 lessons', and '3 projects'. The first course is 'Welcome to the Data Analyst Nanodegree Program'. The second course, 'Introduction to Data Analysis with Pandas and NumPy', is expanded, showing a list of lessons (L1-L5) and a project (P). Callouts with arrows point to specific elements: one points to the '5 courses' header, another to the 'Introduction to Data Analysis with Pandas and NumPy' course title, a third to the 'The Data Analysis Process' lesson, a fourth to the 'Investigate a Dataset' project, and a fifth to the 'Advanced Data Wrangling' course title. To the right of the screenshot, four text boxes provide context: 'Nanodegrees contain one or more courses' (pointing to the course list), 'Non-subscribers users may take a limited range of free stand-alone courses' (pointing to the program title), 'Each course contains one or more lessons' (pointing to the lesson list), and 'Each course contains one project' (pointing to the project list).

**Program Outline** 5 courses 20 lessons 3 projects

Course 1: Welcome to the Data Analyst Nanodegree Program

Course 2: Introduction to Data Analysis with Pandas and NumPy

Learn the data analysis process of questioning, wrangling, exploring, analyzing, and communicating data. You will work with data in Python using libraries like NumPy and pandas. 14 hours

- L1 The Data Analysis Process: Learn about the data analysis process and the Python packages used in this course
- L2 Jupyter Notebooks: Jupyter Notebooks are a great tool for sharing insights and visualizations alongside your code. This lesson covers how to create them and utilize their various features.
- L3 Exploring and Inspecting Data: Use the pandas library to load data, view its properties, and start asking data analysis questions
- L4 Manipulating Data using Pandas and NumPy: Use the pandas library to perform data cleaning, filtering, and reshaping tasks. This includes troubleshooting issues with data as well as optimizing for memory usage and speed.
- L5 Communicating Results: Draw conclusions and communicate results to stakeholders by calculating statistics and creating basic data visualizations with the pandas library

P Investigate a Dataset: Choose one of Udacity's curated datasets, perform an investigation, and share your findings.

Course 3: Advanced Data Wrangling

Nanodegrees contain one or more courses

Non-subscribers users may take a limited range of free stand-alone courses

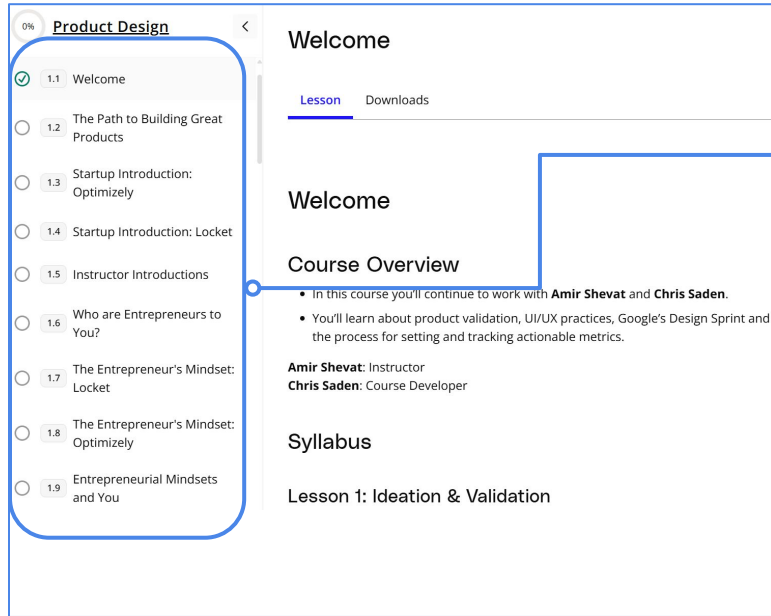
Each course contains one or more lessons

Each course contains one project

Fig.1. Screenshot of Udacity's *Data Analyst Nanodegree Program* landing page (taken March 2026.)



# Lessons themselves are broken up into bite sized learnings



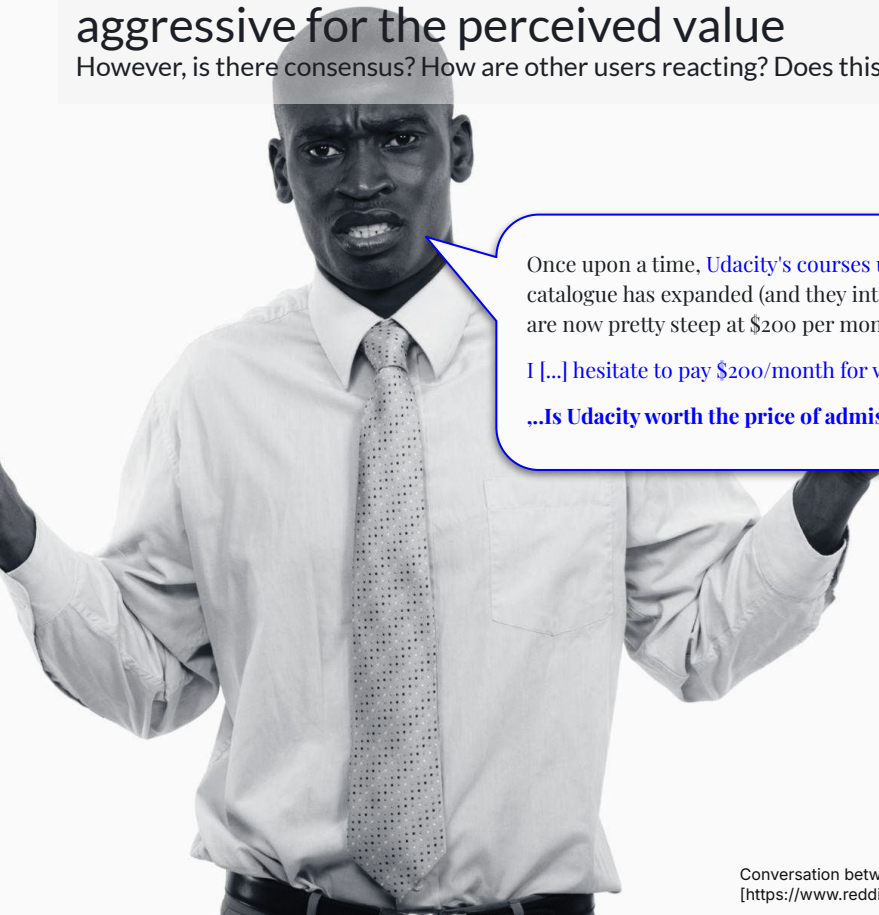
Each lesson has several 'sub-lessons', which include:

1. Written text (syllabi, course material)
2. Video explainers
3. Quizzes and activities

Fig.2. Screenshot of Udacity's *Product Design* individual course Lesson outline ( taken March 2026.)

# Our users have noticed these changes, with some finding the pricing model too aggressive for the perceived value

However, is there consensus? How are other users reacting? Does this affect their usage behavior?



Once upon a time, **Udacity's courses used to be free**. But ever since their course catalogue has expanded (and they introduced these 'nanodegrees') their courses are now pretty steep at \$200 per month. **So, that's \$2400 per years. Per course.**

**I [...] hesitate to pay \$200/month for what amounts to an online course.**

**...Is Udacity worth the price of admission?**

Each course's full price would itself allow access to a project, so I don't think it's an accident that the Nanodegree has the same monthly price as full access to one course. The **courses themselves are all still free**, it's just you pay for a project and coaching for each one.

You could **just take the Web Development and Javascript courses for free** and **create your own projects** based on the material you've learned.

# Core question

Udacity just switched from a 'free' model to a subscription-based 'freemium' model betting that access to experts (project evaluation, help with material, pacing guidance) would justify this change.

- 1/ What is the state of the user? What is their reaction to this new model?
- 2/ What improvements can be made to product to add value, increase project completion rate, and encourage more subscriptions/renewals?

*- balanced with -*

- 3/ What improvements can be made that underscore our company values, namely, our commitment to equitable access to lifelong learning?





## Usage Statistics

# The overall number of users is up, though retention presents a challenge

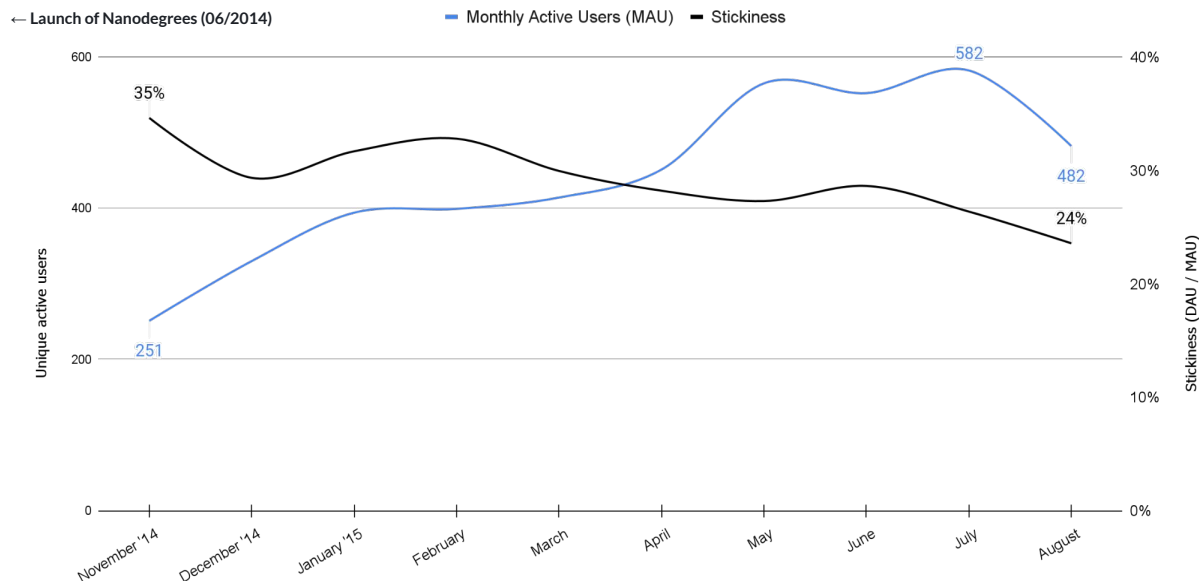


Fig. 3. Monthly Active Users (MAU) plotted against 'Stickiness' (Daily Active Users (DAU) / MAU). DAU calculated as the month's-end average number of daily users. Both MAU and DAU are defined with reference to users who spent at least one minute on the platform or completed a lesson or project.

Since the launch of Nanodegrees, additional free courses, and the new pricing structure, activity has largely seen month-over-month increases in the past 9 months.

Despite a dip in August we see an overall 192% increase in monthly active users (MAU) since November '14.

However, the proportion of daily active users (DAU) to MAU ('stickiness') has steadily declined.

Users may not find long term value in our platform and disengage, creating a revolving door of users

... But who is leaving?

# Digging deeper, a cluster analysis reveals different behaviors among users

but all seem jolted—good and bad—by a mysterious event in March 2015

← Launch of Nanodegrees (06/2014)

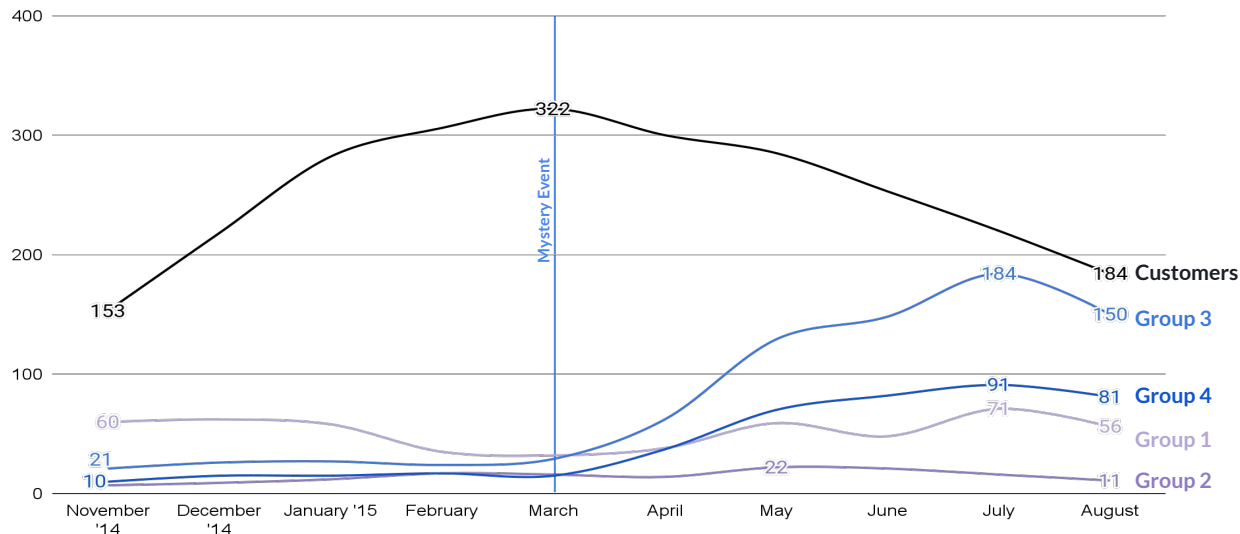


Fig. 4. Monthly Active Users (MAU) per user segment.

## Before March 2015:

MAU increases among Customers

The launch of Nanodegrees may have triggered an increase in users

MAU for other segments is consistently low, despite the expansion of free course offerings.

## After March 2015:

MAU decreases among Customers, but increases for other groups, notably Groups 3 and 4.

A similar story emerges when users are split by cohort (2-month windows).



I couldn't find any announcement on Udacity's blog/in tech reviews of that time that announce any major changes to Udacity in February/March. More investigation warranted.

## Stickiness remains largely stagnant and low for Groups 1 - 4, declines for Customers

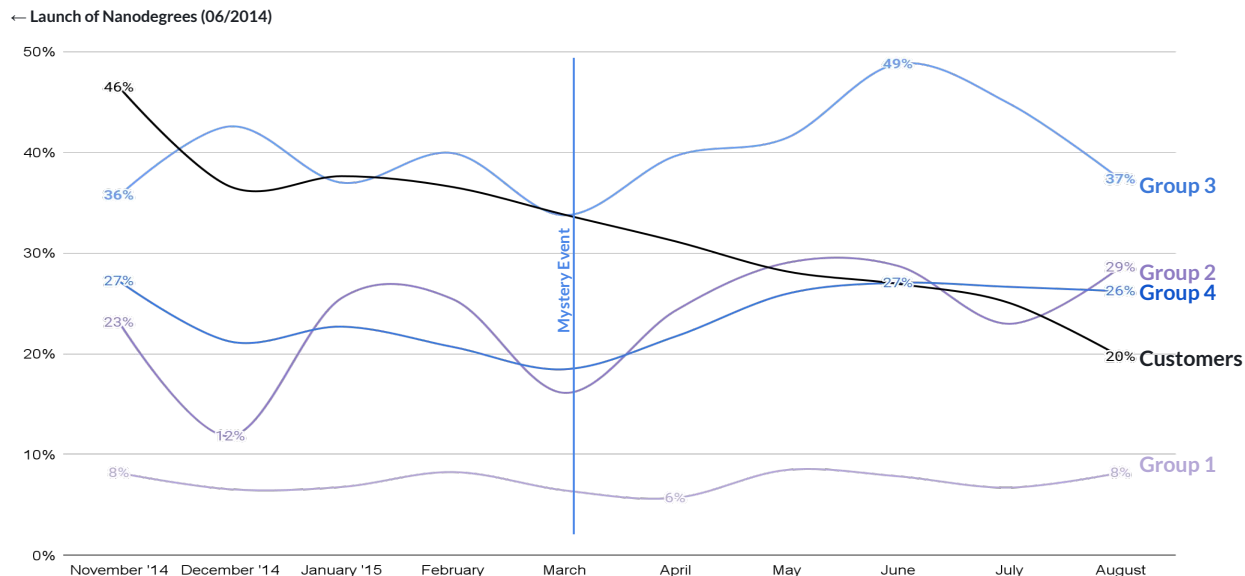


Fig. 5. 'Stickiness' over time. 'Stickiness' is defined as average month-end daily users divided by the total count of monthly average users.

By contrast, there is no pre-/post-March story for 'stickiness,' which remains stagnant and low for Groups 1, 2 and 4. Group 3 is the highest of all groups and peaks near 50%, but returns to Nov '14 levels by August '15.

For Customers, we see an almost precipitous decline in stickiness over these 9 months (-245% from Nov 2014 to August 2015).

Occasional users may not be receiving or perceiving the best value of our platform: We recommend evenly-paced learning (i.e., daily logins) for best results

Understanding our users and their behavior may shed light on these usage statistics.



# Our Users

Explorers • Dabblers • Avid Learners • Freemium Pros • Customers



# Meet our users

Users fall into 5 distinct groups based on their behaviors or Udacity membership

Group 1  
**Explorers**



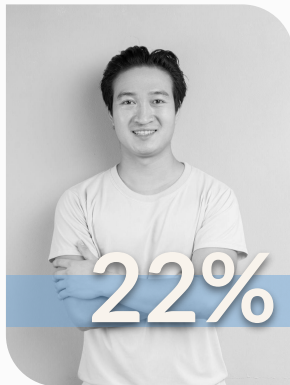
“I’m trying a few courses to see which one’s right for me. I’ve watched some videos so far, but haven’t yet actually completed a lesson.

Group 2  
**Dabblers**



“I’m starting to get serious about 1 or 2 courses, but haven’t gotten far in my learning yet. I may struggle with the course materials.

Group 3  
**Avid learners**



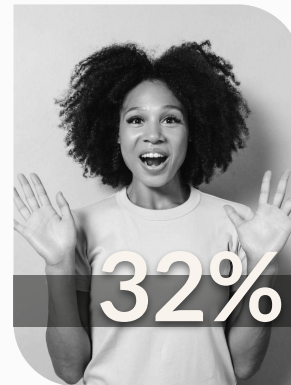
“I’m ready to commit to a few lessons, and I’ll stick with Udacity for a few weeks. I may not see the benefit of a paid subscription yet.

Group 4  
**‘Freemium’ pros**



“I’m heavily committed to learning on Udacity and know how to take advantage of the system: I value the skills I can learn, but I don’t want to commit financially.

Group 5  
**Customers<sup>†</sup>**



“I work hard and commit the days and hours necessary to complete projects and further my learning. Once I’ve finished, though, I may leave Udacity behind.

Quotes are constructed from quantitative and qualitative user behavior detailed across the next several slides.

\*Base n = 1,168; Sixty-nine users (approx. 5.5% of total sample, n = 1,237) did not complete any lessons, complete any projects, or spend any time on Udacity aside from creating an account/logging in. These users were removed from analysis

† Customers are defined as users who completed at least one project as project completion requires a paid subscription. However, there may be customers who nevertheless have not completed a project. As such, 18% is likely an underestimate of our customer base.



JUMP TO METHODS  
for details of cluster analysis

# Explorers

# 33%

Ending MAU: ↘56  
Ending Stickiness: →8%

On average, Explorers spend a few days bouncing around Udacity.

While they may attempt a few lessons, few Explorers actually complete one. Some may just be scoping things out, but others may grind their gears in Courses that are not at their level.

While we expect many Explorers to come and go, those spending the most time with us may evolve into Dabblers or even Customers.



'Scan or study' option for whoever's reading

Lessons completed, avg ( std)

↓ 0.6 (1.4)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 0    | 0   | 0    | 1   | 9    |

Time per lesson in mins, avg (std)

↓ 82.4 (79.0)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 2    | 21  | 54   | 120 | 378  |

Days on Udacity, avg (std)

↓ 2.8 (2.6)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 1    | 1   | 2    | 3   | 13   |

Time per day in mins, avg (std)

↓ 37.5 (28.3)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 2    | 15  | 31   | 53  | 122  |

Arrows and colors represent significant differences at an alpha = 0.05 level *without* correction. Statistical model was a 1-sample t-test against the all-group mean (base n = 1,168)

# Dabblers

5%

Ending MAU: ↘11  
Ending Stickiness: →29%

Dabblers are well on their way: They've completed a few lessons and have devoted hours to our platform across nearly 3 weeks, on average.

Dabblers spend more time on lessons than any other group, perhaps reflecting difficulty with course material (even when accounting for outliers).

Shepherding Dabblers into the right courses may help them graduate to more advanced usage or a subscription.

Lessons completed, avg ( std)

↓ 3.3 (3.4)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 0    | 1   | 2    | 5   | 14   |

Days on Udacity, avg (std)

↓ 19.7 (2.6)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 3    | 8   | 13   | 29  | 70   |

Time per lesson in mins, avg (std)

↑ 501.5 (201.6)

| Min: | Q1: | Med. | Q3: | Max:  |
|------|-----|------|-----|-------|
| 295  | 393 | 463  | 534 | 1,589 |

Time per day in mins, avg (std)

79.2 (24.0)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 36   | 64  | 72   | 92  | 137  |

## Explorers and Dabblers may balk at our lesson format, not yet see the value of our coaching services, or be stymied by a price barrier



“ [T]he lecture segments are very brief, with most lasting around a minute or less. **The sum total of the video content in the third lesson on convnets is less than 15 minutes.**

“ "Deep Learning" is clearly **lacking substance** as **concepts are introduced very superficially in about 5 min** before you are expected to implement these methods in assignments.

“ "Deep Learning" is rated as a advanced class and has a **long list of requirements**. But even taking these into consideration, **the class itself does not provide sufficient explanations for new concepts** introduced here...

“ The programming assignments ... are **lacking in instruction**... You likely won't be able to make much progress on the assignments without prior knowledge of machine learning and TensorFlow or **doing a lot of extra research outside of the course materials**.

“ I think this course is awesome! However, this course is **not meant for beginners** in the [Reinforcement Learning] domain. **I recommend taking David Silver's free online lectures** before this course. I am experimenting that mixture and **both courses complement superbly**. This course is a more advanced and fast-paced course... compared to standard RL literature. - Anonymous, 2018, Reinforcement Learning

Explorers and Dabblers feel that short format videos do not adequately prepare them for quizzes and assignments

Prerequisites may not be informative enough for Explorers and Dabblers to decide what level--basic, intermediate, advanced--they're at and what skills they need to bring with them to succeed.

Even if they enjoy our content, some users report leaving our platform or supplementing our materials with other online courses when struggling with lesson concepts and assignments.



Quotes were pulled from Quora, Reddit and Class Central. Several different courses are reviewed here, mostly from 2014 - 2016 (but some more modern)

Lessons completed, avg (std)

↓ 12.3 (7.0)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 0    | 7   | 11   | 17  | 36   |

Days on Udacity, avg (std)

↓ 23.9 (12.2)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 1    | 15  | 23   | 33  | 55   |

Time per lesson in mins, avg (std)

185.3 (74.4)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 53   | 127 | 171  | 235 | 441  |

Time per day in mins, avg (std)

↑ 95.0 (39.0)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 38   | 67  | 85   | 111 | 247  |

22%

Avid Learners

Ending MAU: ↘150  
Ending Stickiness: ↘37%

Avid Learners are starting to get into the groove. They devote an hour and a half per day to learning on Udacity and, like Dabblers, spend around 3 weeks with us.

Unlike Dabblers, Avid Learners complete a dozen lessons, or about a Course-worth of work.

As our 'stickiest' group, what can we do to earn their subscription?

Lessons completed, avg ( std)

↑ 26.8 (12.0)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 9    | 19  | 24   | 34  | 67   |

Days on Udacity, avg (std)

↑ 52.0 (20.2)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 18   | 38  | 51   | 64  | 167  |

Time per lesson in mins, avg (std)

↑ 231.2 (123.4)

| Min: | Q1: | Med. | Q3: | Max:  |
|------|-----|------|-----|-------|
| 49   | 169 | 208  | 277 | 1,040 |

Time per day in mins, avg (std)

↑ 112.1 (45.2)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 49   | 82  | 103  | 138 | 331  |

9%

‘Freemium’ Pros

Ending MAU: ↘81  
Ending Stickiness: →26%

‘Freemium’ Pros are expert navigators of short-term learning opportunities without the commitment of a subscription. They spend on average just shy of two months with us, and devote nearly 2 hours per day to our lessons.

Like Avid Learners, they have completed a Course or two’s worth of work.

How do we convert these super users to super customers?



# Avid Learners and 'Freemium' Pros are likely already advanced students

A review of our course catalog with an eye for difficulty level across free and paid-only courses may reveal what users think about our 'free sample.'



“Extremely **slow paced**, with **most of the topics handwaved**. I've read Sutton's [the instructor's] book. Topics (not all) from the book were covered on a **shallow level**.

**Additional topics were explained [such that] you need to read other resources in order to actually implement them.**

“I couldn't make it through the first week. The pace is very slow and the course doesn't seem to be very thorough.

**Maybe it's a good idea for people that are not very bright and have no knowledge whatsoever on the topic.** – Anonymous, 2016, Reinforcement Learning

“While **some sections are paced far too slowly**, others **rocket ahead** without even preparing the students for the concepts they quiz you on.

“For **math or computer science students**, I'd imagine this **course would drag** and then suddenly become more what they're used to. **For everyone else, avoid.** – Kevin C Murray, 2018, Reinforcement Learning

“In the end, you likely end up **spending hours on additional research using outside resources** before you will be able to solve most of the problems stated in the assignments ... **what [is] the benefit of taking this Udacity class?**

Avid Learners and 'Freemium' Pros are most likely already well versed in many of our subject offers.

Yet, difficulties finding the right course persist, with many comments mentioning slow pacing, and information being both too shallow and too complicated both within and between courses.

Some find difficult figuring out who exactly a class is for

Leaving the platform to find supplemental information has some wondering what the value of Udacity is, despite the availability of our paid coaching services.

Lessons completed, avg ( std)

↑ 30.3 (14.9)

| Min: | Q1: | Med. | Q3:  | Max: |
|------|-----|------|------|------|
| 0    | 18  | 29   | 42.8 | 75   |

Days on Udacity, avg (std)

↑ 64.3 (31.5)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 7    | 41  | 60   | 80  | 171  |

Time per lesson in mins, avg (std)

↑ 207.3 (101.3)

| Min: | Q1: | Med. | Q3: | Max:  |
|------|-----|------|-----|-------|
| 53   | 150 | 183  | 239 | 1,270 |

Time per day in mins, avg (std)

↑ 91.8 (28.2)

| Min: | Q1: | Med. | Q3: | Max: |
|------|-----|------|-----|------|
| 22   | 71  | 87   | 108 | 223  |

33%

Customers

Ending MAU: ↘184  
Ending Stickiness: ↘20%

Unsurprisingly, Customers spend the most time with us across (a) total days in our system and (b) average time per day, and have completed the most lessons.

However, Customers complete on average just 2.5 projects. Although it's impossible to tell how many unique courses they've attempted, this project average seems low, suggesting that Customers sleep on one of our most important core benefits. They may leave us as a result.



# Customers have issues with Course projects and expert feedback

They do not even mention our other selling points



“

I give Model Building and Validation 3.5 out of 5 stars: Good. Admittedly, **I did not do the final project** that involves creating a fraud detection model, which could take a significant chunk of time. – Gregory J Hamel 2016, Model Building and Validation

“

**Don't pay** for the enrollment, all of **the course material is free..** Their **mentor feedback wasn't that great.** When I got stuck on a project, they just kept sending redundant nonconstructive information, like. "Hey you're doing a great job check out this link – David, 2016, Intro to CS

“

Felt like buying a car with all the extras that you won't use. For 10 to 20x the cost of other providers i do not recommend Udacity model. Either go for something cheaper for knowledge acquisition or save for a master/ post- grad... – Anonymous, 2018, Data Analyst Nanodegree

“

[T]he worst part is, Nanodegree content is unlocked only for couple of months, I can't access it anymore. Huge waste of money. – Anonymous, 2016, Deep Learning Nanodegree

“

I never got past the first lesson, it was very hard to figure out what I needed to do. – Anonymous, 2016, Deep Learning Nanodegree

Projects aren't a big motivator for some Customers, while others found that feedback from our experts was not worth the cost of the subscription.

Despite the fact that we advertise close partnership with leading tech firms and top universities, like Google and Stanford, and indeed many of our instructors come from these institutions, some students find that the project reviews do not meet these set standards

Some lament that subscription-bound access to course content is a “huge waste of money”

As with other segments, finding the appropriate course remains challenging.

## But it's not all bad news: Many Customers love us

The challenge comes from understanding how to effectively communicate these benefits to non-subscribers and, critically, understand why Customers are leaving us anyway



“All I can say is wow. **If you want to watch a master,** irrespective of your experience as Python programmer. **Peter Norvig is someone you will want to learn with.** Each week his lesson explored different concepts in computer science. His lectures had a different theme each week and made for a very interesting experience. – Anonymous, 2013, Design of Computer Programs

“One of the strengths of this course is its **emphasis on hands-on learning.** Throughout the modules, there are numerous coding exercises and assignments that allow learners to implement machine learning algorithms using popular libraries such as scikit-learn or TensorFlow. This **practical approach enables students to gain practical experience** and develop their skills in applying machine learning techniques to **real-world problems.** – Jasmitha Kolamuri, 2024, Machine Learning Fundamentals

“Very **entertaining.** Both **challenging** and **fun.** Can be **useful** to get the gist of programming and algorithms, learn some advanced Python tricks, and find some nice general solutions to problems and puzzles of varying difficulty. – Mauro Lacy, Design of Computer Programs, 2016

For some courses, Customers are impressed by the quality of the lessons and even more so by the top talent presenting the material. Instructors are often called out by name when Customers laud a class.

Customers celebrate that quizzes, assignments and projects are couched in real-world problems.

But just as many leave generic positive reviews, failing to connect their Course experiences to our Customer-exclusive benefits.



# Reflection



## Revisiting usage statistics, we see that Customer MAU is in decline while MAU for other users surges past March 2015

Customers may not see enduring value with a subscription past course completion, while our ever-broadening course catalog / Course improvements may attract non-paying users. Understanding whether Customers become Avid Learners or 'Freemium' Pros may provide insight here. The March, 2015 mystery still remains.

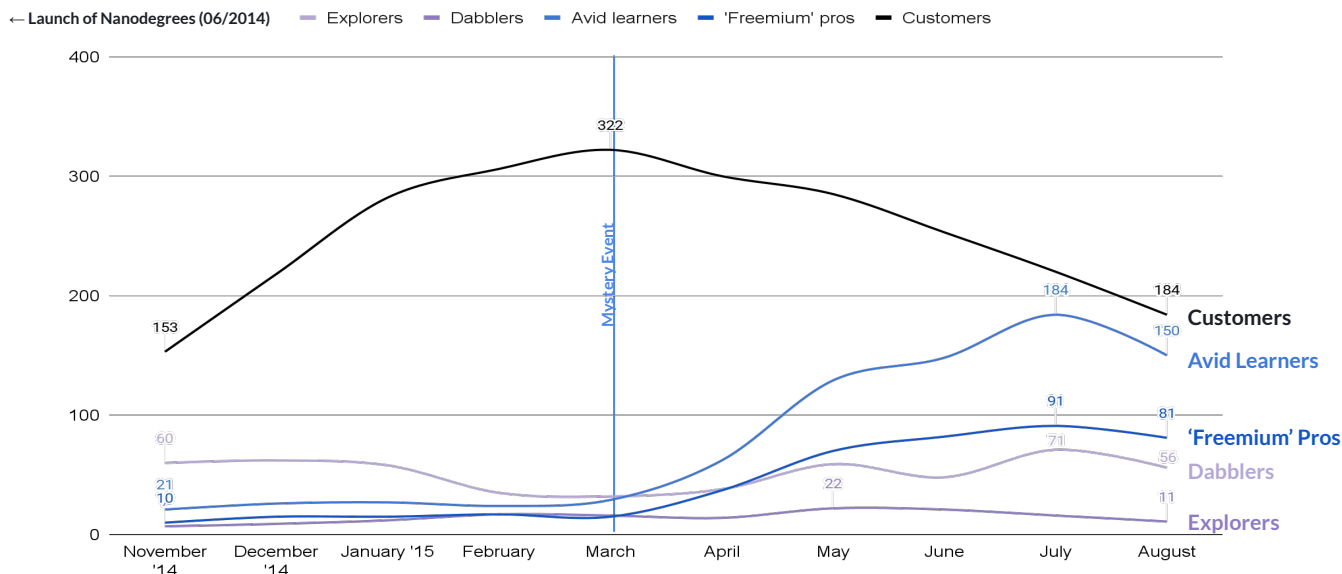


Fig. 5'. Monthly Active Users (MAU) per user segment.

## Stickiness remains stagnant and low for free Users, while it declines for Customers.

Again, Customers may not see enduring value with a subscription past course completion, while our ever-broadening course catalog / Course improvements may attract non-paying users. Understanding why Avid Learners and 'Freemium' Pros exhibit the desired learning behavior yet are "ABD" is crucial.

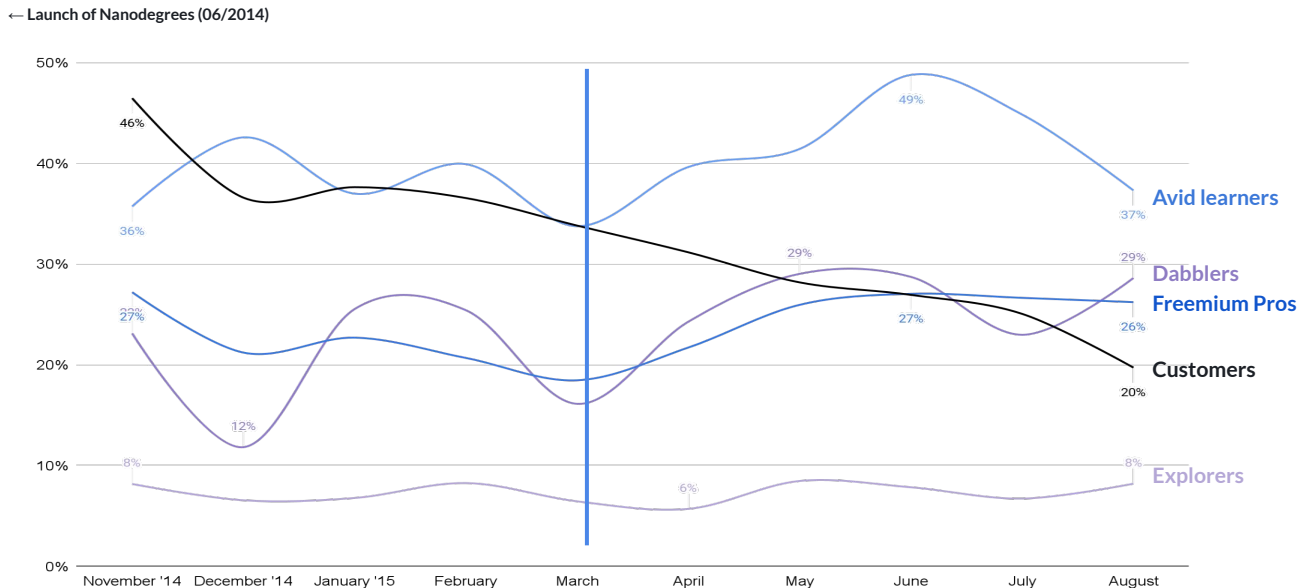


Fig. 6: 'Stickiness' over time. 'Stickiness' is defined as average month-end daily users divided by the total count of monthly average users.

# Reflection

Udacity just switched from a 'free' model to a subscription-based 'freemium' model betting that access to experts (project evaluation, help with material, pacing guidance) would justify this change.

## 1/ What is the state of the user? What is their reaction to this new model?

All things told, Monthly Active Users has almost doubled in the past 9 months.

The overall increase of students demonstrates our company's commitment to equitable learning solutions, even with the rollout of paid access to Nanodegrees/full course access.

MAU has increased for Customers, specifically. However, MAU among Customers has steadily declined since March, 2015, and 'Stickiness' (Daily Active Users /MAU) has steadily declined for this population over this 9-month period.

At the same time, MAU increased among non-paying users, particularly 'Freemium' Pros and Avid Learners (together 30% of users) since March 2015, with stickiness levels remaining constant.



# Reflection

Udacity just switched from a 'free' model to a subscription-based 'freemium' model betting that access to experts (project evaluation, help with material, pacing guidance) would justify this change.

## 1/ What is the state of the user? What is their reaction to this new model?

Our users fall into 5 distinct categories, depending on whether they're customers or what behaviors they exhibit across our platform.

Most users spend a lot of time on our platform, indicating that users value our product.

However, users differ in how many Lessons they complete, how many days/hours they commit, and--through reviews on other websites--in their readiness and motivations for our Courses.

These differences may explain the evolving MAU and stickiness scores we observed over the past 9 months



## Next Steps

Given the changes in usage across groups over the past 9 months, gathering more data is crucial to retain Customers and convert non-paying users.

- 2/ **What improvements can be made to product to add value, increase project completion rate, and encourage more subscriptions/renewals?**

**A. Triage the bleeding:** Find out why Customers are leaving our platform

While the announcement of the Nanodegree, additional courses, and other changes may have initially drawn a lot of new customers, our customer base may be reverting back to pre-Nanodegree levels. Three avenues to explore include:

- a/ **Understanding when Customers leave** (e.g. *After how many Nanodegrees? or How many days after their last project?*) may shed light on when/whether Customers receive the full value of our offer. Can we postpone when Customers feel 'done?'
- b/ **Understanding how/whether Customers value our paid-only entitlements** may help make these elements indispensable. How many of our customers become 'Freemium' Pros or Avid Learners?
- c/ **Understanding what happened in March 2015**, a catalyst event, may inform what changes we keep and any backpedalling we may need to do.

**We only have data from 9 months. User behavior may be cyclic or otherwise may vary by time of year.**

While it may be tempting to compare the past 9 months to previous years, the change in business model makes this year's data incomparable. Our best course of action may be to wait until more data is available.





## Next Steps

Given the changes in usage across groups over the past 9 months, gathering more data is crucial to retain Customers and convert non-paying users.

- 2/ **What improvements can be made to product to add value, increase project completion rate, and encourage more subscriptions/renewals?**

**B. Revisit incentives for subscribing:** How do we convert Avid Learners and 'Freemium' Pros, 31% of our user base, to Customers?

We currently offer:

- a/ 50% off if you finish the nanodegree
- b/ Access to pacing guidance
- c/ Access to coaching
- d/ Code/project review at the end of each course

**How do we make our subscriber-only perks must-haves?** These more advanced users may not see the value in these offerings, especially if they can self-serve on projects, coaching and pacing.



## Next Steps

Given the changes in usage across groups over the past 9 months, gathering more data is crucial to retain Customers and convert non-paying users.

- 2/ **What improvements can be made to product to add value, increase project completion rate, and encourage more subscriptions/renewals?**

**C. Review (free) course materials:** Quality is top of mind across all consumer segments.

- a/ **Understanding the value of our 'free trial':** Are our free lessons as good quality / fairly represent the quality of our paid-only courses?
- b/ **Understanding browsing behavior:** Is the process of finding relevant courses that are skill-appropriate seamless?



# Nutrition Facts

Serving Size 2 pieces (3g)

Servings 6

Calories 5

Amount/Serving %DV

Total Fat 0g 0%

Sodium 0mg 0%

Total Carb. 2g 1%

Sugars 0g

Sugar Alcohol 2g

Protein 0g

Not a significant source  
of nutrients

APPENDIX

Percent Daily Values (DV) are

# User snapshot

|                                      |  Explorers |  Dabblers |  Avid Learners |  'Freemium' Pros |  Customers |
|--------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Total number of days on platform*    | 2                                                                                           | 20                                                                                         | 24                                                                                                | 52                                                                                                  | 63                                                                                            |
| Avg overall time investment in mins* | 122                                                                                         | 1,590                                                                                      | 2,013                                                                                             | 5,396                                                                                               | 5,796                                                                                         |
| Avg # lessons completed*             | <1                                                                                          | 3                                                                                          | 12                                                                                                | 27                                                                                                  | 30                                                                                            |
| Avg # projects completed             | -                                                                                           | -                                                                                          | -                                                                                                 | -                                                                                                   | 2                                                                                             |
| Number of courses visited (avg)*     | 1 - 4 (1.3)                                                                                 | 1 - 1.8 (1.3)                                                                              | 1 - 4 (1.3)                                                                                       | 1 - 2.5 (1.3)                                                                                       | 0.8 - 1.67 (1.2)                                                                              |
| Max streak in days*                  | 1                                                                                           | 4                                                                                          | 4                                                                                                 | 10                                                                                                  | 8                                                                                             |
| Average streak in days               | <1                                                                                          | 1                                                                                          | 1                                                                                                 | 2                                                                                                   | 2                                                                                             |
| Number of streaks                    | 2                                                                                           | 9                                                                                          | 11                                                                                                | 17                                                                                                  | 26                                                                                            |
| Avg time per day in mins*            | 37                                                                                          | 79                                                                                         | 95                                                                                                | 112                                                                                                 | 91                                                                                            |
| Avg time per lesson in mins*         | 82                                                                                          | 501                                                                                        | 185                                                                                               | 231                                                                                                 | 207                                                                                           |
| Count (n)                            | 389                                                                                         | 53                                                                                         | 252                                                                                               | 104                                                                                                 | 370                                                                                           |
| Percent of users                     | 33%                                                                                         | 5%                                                                                         | 22%                                                                                               | 9%                                                                                                  | 32%                                                                                           |

\*Variable used in cluster analysis

# Data preparation

## Cleaning:

Rows with 0s across *num\_courses\_visited*, *lessons\_completed*, *projects\_completed* and *total\_minutes\_visited* were removed as errant entries. After all relevant rows were removed, data from 1,168 unique users (down from 1,237) were analyzed

| acct | utc_date   | num_courses_visited | total_minutes_visited | lessons_completed | projects_completed |
|------|------------|---------------------|-----------------------|-------------------|--------------------|
| 0    | 2015-01-09 | 1                   | 12                    | 0                 | 0                  |
| 0    | 2015-01-10 | 2                   | 37                    | 0                 | 0                  |
| 0    | 2015-01-11 | 2                   | 54                    | 0                 | 0                  |
| 0    | 2015-01-12 | 1                   | 33                    | 0                 | 0                  |
| 0    | 2015-01-13 | 1                   | 65                    | 0                 | 0                  |
| 0    | 2015-01-14 | 1                   | 152                   | 1                 | 0                  |
| 0    | 2015-01-15 | 1                   | 142                   | 0                 | 0                  |
| 0    | 2015-01-16 | 0                   | 0                     | 0                 | 0                  |
| 0    | 2015-01-17 | 1                   | 10                    | 0                 | 0                  |
| 0    | 2015-01-18 | 1                   | 38                    | 0                 | 0                  |
| 0    | 2015-01-19 | 1                   | 98                    | 1                 | 0                  |
| 0    | 2015-01-20 | 0                   | 0                     | 0                 | 0                  |
| 0    | 2015-01-21 | 0                   | 0                     | 0                 | 0                  |

# Variable definitions

| Native variables                                                  |                                                         | Engineered variables                                                                  |                                                                                |
|-------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <i>acct</i> , int                                                 | Unique account identifier                               | <i>max_streak</i> , float;<br><i>avg_streak</i> , float;<br><i>num_streak</i> , float | The maximum, average and number of access streaks (visits on consecutive days) |
| <i>utc_date</i> , date                                            | Date of access                                          | <i>tot_num_days</i> , int                                                             | Total number of days a user visited Udacity                                    |
| <i>num_courses_visited</i> , int                                  | Number of courses visited on a given visit              | <i>avg_time_per_day</i> , float;<br><i>avg_time_per_lesson</i> , float                | Average time spent on Udacity platform / individual lessons                    |
| <i>total_minutes_visited</i> , float                              | Length of visit (in minutes)                            | <i>total_minutes_visited</i> , float                                                  | Used in calculation of <i>avg_time_per_{lesson,day}</i>                        |
| <i>lessons_completed</i> , int<br><i>projects_completed</i> , int | Number of lessons / projects completed on a given visit | <i>num_courses_visited</i> , float<br><br><i>projects_completed_any</i> , [0,1]       | Average number of courses visited per day<br><br>Used to define paid users     |

# Cluster analysis

## Parameters

**Inputs:** Cluster analysis was performed on non-customers, defined as users who had not completed any projects (n = 949)

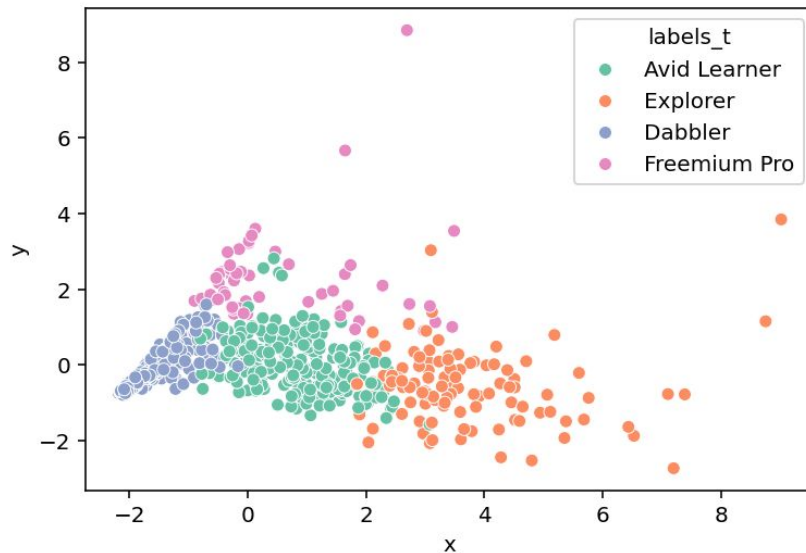
**Model:** Bisecting K Means (implemented in sklearn) model with  $n\_clusters = 4$ ,  $n\_init=10$  and all other parameters default.

## Variables:

*total\_minutes\_visited*, *max\_streak*, *tot\_num\_days*, *avg\_time\_per\_day*, *avg\_time\_per\_lesson*.

**Scaling:** All variables were scaled to have 0 mean and unit variance using sklearn's *StandardScaler* (all parameters default)

**Silhouette score:** 0.4 (weak-moderate clustering)





## Quantitative brand architecture validation

[Back to menu](#)



# Quantitative brand architecture validation

**The client** | **AlphaCo:** A B2B software company with an expanding portfolio of accounting and bookkeeping products/ services for small businesses.

01

## Context

Given AlphaCo's expanding portfolio of products and services, a newly organized brand architecture was developed to guide users to the correct information.

02

## Issue

Internal teams at AlphaCo proposed a new brand architecture, but leadership won't move to adopt it for an upcoming website redesign without quantitative validation.

*"We're numbers people"*

– AlphaCo Senior Brand Manager

03

## The ask

Quantitatively validate the new brand architecture.

Quantitatively and qualitatively motivate a choice among labels at two levels.



# The solution

**Planning:** Our team had never quantitatively validated a brand architecture prior to this engagement. I researched and proposed a new method, tree testing, with A/B testing of labeling candidates.

**Instrument:** Online tree-test survey (Optimal Workshop) of 400 small business owners and accountants. A/B testing of brand architecture and 4 sets of labels. Follow-up survey to gauge participants' subjective experience with the architecture

**Timeline:** 3.5 weeks

**My role:**

1. Client communication (w/ team)
2. Survey development
3. Data collection
4. Story-development & visualization (w/ team)

**Agency + Client education:** What is a tree test?

**Tree testing is an unfamiliar methodology to most:** I needed to educate and assure both Lexicon upper management and the client team on the basics and distinct advantages of tree testing for brand architecture research before project approval.

# Research proposal: *What is a tree test?*



## Sample Question

### Task 1 of 9

Imagine you are a business owner at a small company. At the end of the month it is time to make sure all staff receive their compensation. Using the menu below, where would you find information to accomplish this task?

Manage your compliance

Manage your money

Manage your workforce



Manage your compliance

Manage your money

Manage your workforce



Get payroll

Get benefits

Get organized

Get expert advice

Manage your compliance

Manage your money

Manage your workforce



I'd find it here

Get payroll

Employee payment

Payroll taxes

Get benefits

Get organized

Get expert advice

## Client education

Before moving forward with research, we had to define and walk-through a simple tree-test:

A tree test is a quantitative UX research method to validate information architectures:

1. Confirms that architecture is clear and navigable
2. Identifies where users get lost or backtrack, yielding direct insights on where and how to improve.

Participants complete the study online (unmoderated). Success rates, click paths, and time-on-task are collected automatically.

# Setting expectations

## Primary Measure: Success Rate

The percent of respondents who successfully navigated the tree on the assigned task.

|        |                      |
|--------|----------------------|
| %80+   | Excellent            |
| 65-80% | Very good            |
| 50-64% | Needs work           |
| <50%   | Needs major redesign |

## Secondary Measure: Directness

The percent of respondents who navigated the tree without backtracking.

|      |                               |
|------|-------------------------------|
| %70+ | Pass                          |
| <70% | Difficulty finding right path |

## Secondary Measure: Subjective Navigability rating

Respondents rated ease of navigation on a 5-point likert scale.

|                                                                                  |                      |
|----------------------------------------------------------------------------------|----------------------|
| >60% 'Easy' / 'Very Easy' ratings & <20% 'Difficult' / 'Very difficult' ratings  | Pass                 |
| <60% 'Easy' / 'Very Easy' ratings or >20% 'Difficult' / 'Very difficult' ratings | Suggests frustration |

## Defining success

Success rates during a tree test are expected to be roughly 20% lower than actual success rates on a finished product (a full website or software with camera-ready graphic design).

Success rate benchmarks are derived from industry-wide tree testing standards. The architecture is validated at 65% or higher.

Additional indicators of success are drawn from:

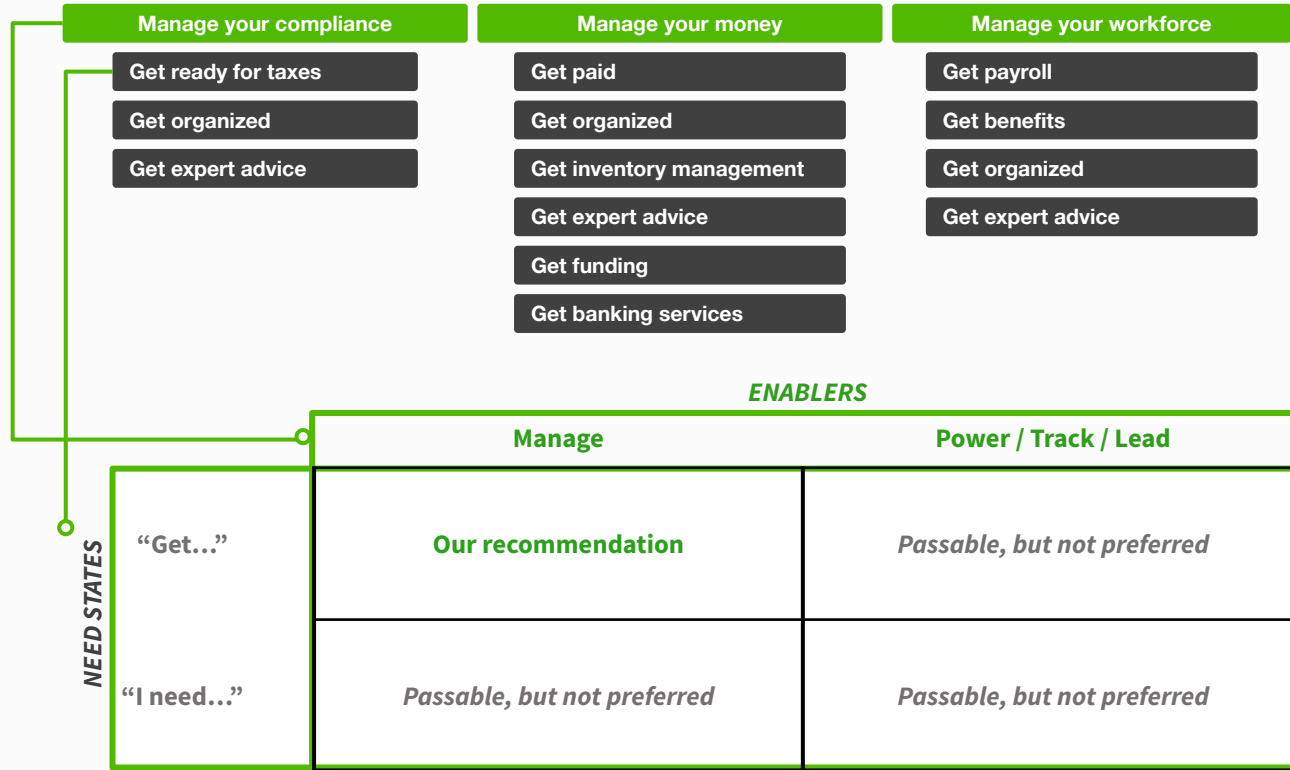
Scalar (Likert) questions in post-test survey

Open-ended questions giving testers an opportunity to comment on navigability

- ★ Our team dedicated considerable time in early stages to aligning on expectations with the client team. Otherwise, a success rate of 65% could seem shockingly low.

## Our Recommended Architecture:

For a clear and consistent system that allows for portfolio expansion, use this structure with these labels



# Executive Summary: Overall Good News

## Is the Architecture Navigable?

**YES: 73% of respondents rated the system as easy to navigate.**  
The overall success rate (68%) exceeded benchmark.

### Enabler Level:

*“Manage”* is preferred over  
*“Power / Track / Lead”*

### Need State Level:

*“Get...”* is preferred over  
*“I Need...”*

### Additional Insights

- Both *“Money”* and *“Compliance”* on the Enabler level might be sources of minor confusion.
- A general pain point: the *“I might need a document”* mindset.

# Unpacking

## Easing into details

We've just shared our recommendation, so now it's time to explain ourselves.

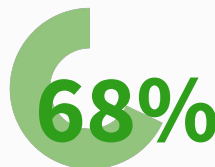
Still at quite a high level, we start introducing numbers in a graphically impactful way and in plain view of the main result ("the proposed architecture is validated!")

At this stage, we wanted to show that *any* option the client chose was a potentially good direction. This keeps:

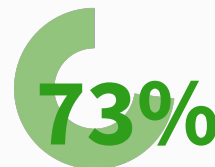
1. The report positive,
2. The cognitive load low, and
3. The clients' secret preference safe before delving into winners and losers

### AlphaCo's proposed architecture is validated across all candidate label sets:

Participants successfully navigated the architecture, positively rated *Ease of Navigation*



average success rate across versions.



of participants said they found navigating the menus *easy* or *very easy*.

| Key: Success rate |            |
|-------------------|------------|
| > 80%             | Excellent  |
| 65–80%            | Very good  |
| 50–64%            | Needs work |
| <50%              | Redesign   |

# Unpacking, cont'd

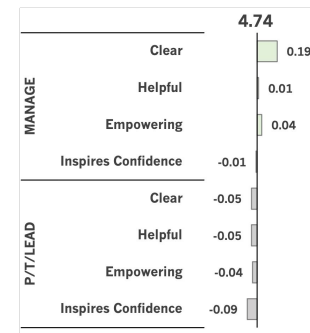
## More easy numbers

As before, we keep numbers to a minimum and apply meaningful color-coding and graphs to start to see how the different versions of the architecture differ from each other.

### Top-level Labels: *Manage* Outperforms *Power / Track / Lead*

**Manage** saw higher success rates and directness scores, indicating easier navigability with this labeling approach.

All labels at the Enabler level were rated highly for key attributes. **Manage** came out slightly ahead.



\*Mean rating of 4.74 on 1–6 Likert scale indicates high overall reception.

[APPENDIX: RATINGS](#)



# In the weeds

## For the “numbers people”

This table was created for the client’s research team, which fully articulates the data reported in aggregate on the previous slides.

We walked the client through this and the subsequent slides so that they could fully understand their data and make more informed decisions. They’re “numbers people” after all!

| How did navigability vary across tasks? |           |                  |              |                        |                 |                           |
|-----------------------------------------|-----------|------------------|--------------|------------------------|-----------------|---------------------------|
| SUCCESS RATE<br>BY TASK                 |           |                  | VERSION      |                        |                 |                           |
|                                         |           |                  | B            | A                      | D               | C                         |
|                                         |           |                  | Manage + Get | Power/Track/Lead + Get | Manage + I need | Power/Track/Lead + I need |
| TASK                                    | 1         | Employee payment | 72           | 53                     | 65              | 61                        |
|                                         | 2         | Time tracking    | 89           | 78                     | 83              | 76                        |
|                                         | 3         | Money movement   | 75           | 62                     | 70              | 73                        |
|                                         | 4         | ST Loan          | 79           | 65                     | 77              | 75                        |
|                                         | 5         | Bookkeeping      | 64           | 53                     | 58              | 47                        |
|                                         | 6         | Manufacturing    | 60           | 57                     | 65              | 61                        |
|                                         | 7         | Invoices         | 72           | 72                     | 77              | 71                        |
|                                         | 8         | Reports          | 67           | 66                     | 53              | 57                        |
|                                         | 9         | Expense tracking | 74           | 80                     | 60              | 70                        |
| Overall success rate                    |           |                  | 72           | 65                     | 67              | 66                        |
| Key: Success rate                       |           |                  |              |                        |                 |                           |
| > 80%                                   | Excellent | 50–64%           | Needs work   |                        |                 |                           |
| 65–80%                                  | Very good | <50%             | Redesign     |                        |                 |                           |

# Client education, redux

## Empowering the client to present the results to their internal teams

Tree tests provide a wealth of information, so much so that it can be intimidating or confusing for clients.

We overcame this with detailed visualizations and instructions for how the client can fully engage with their data (beyond accepting our recommendation at face value).

### Destinations Map: How to Read

Numbers represent how many participants selected a specific function label as the solution for each task (combined from all 4 versions;  $N = 401$ ).

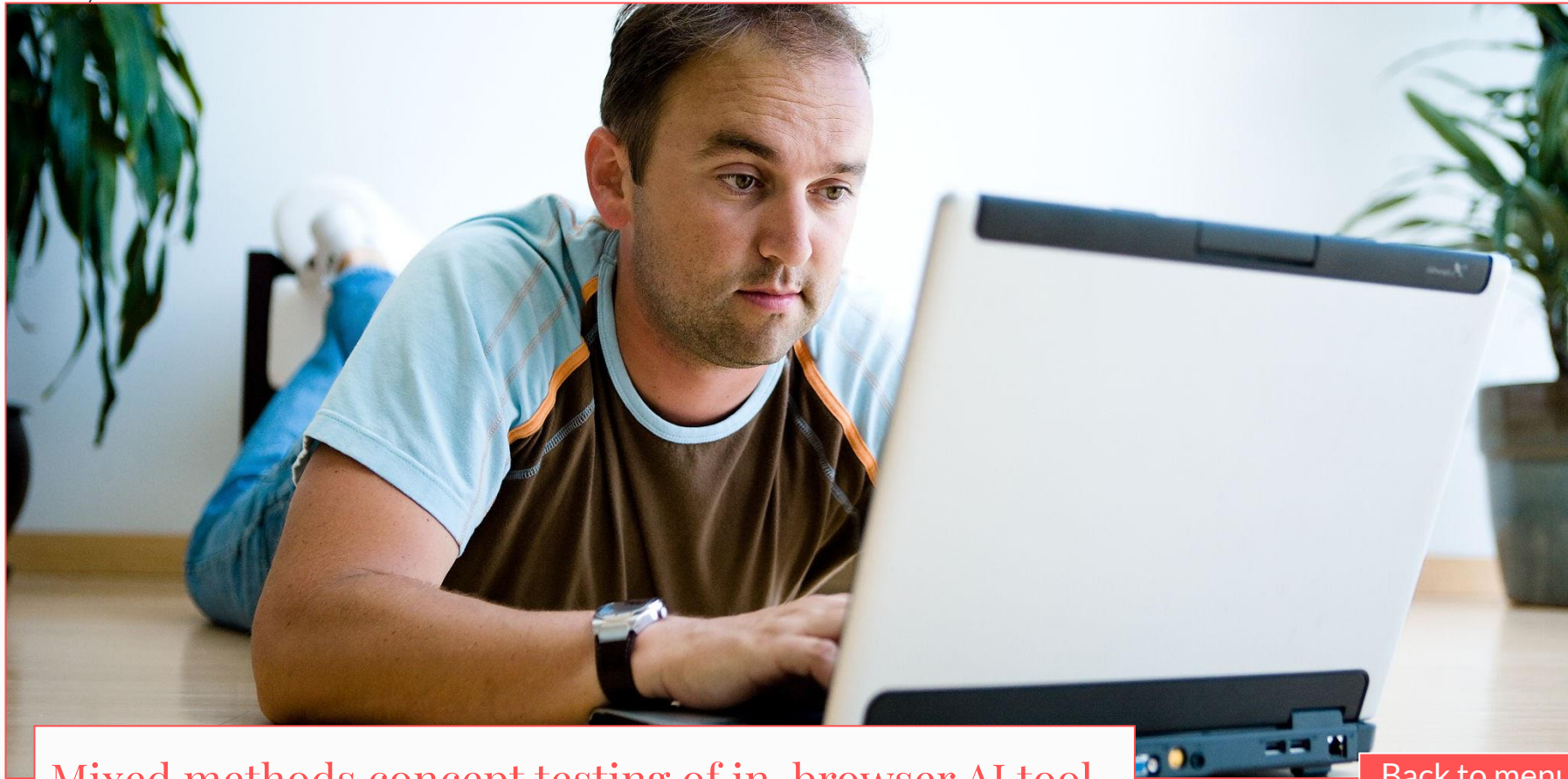
Green boxes are **correct** destinations.

Incorrect destinations are color-scaled in red (i.e., a heat map): darker red = more participants who chose the incorrect solution. Color-scaling is *by task* (in columns).

**Read by columns:** Identify where participants most often went wrong for a given task.

**Reading by rows:** Identify function labels (third level) that serve as *distractors*: functions that consistently sound like a believable correct solution, even when they're not.

| DESTINATIONS        |                        |                      | TASKS |     |     |     |     |     |     |     |     |
|---------------------|------------------------|----------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|
|                     |                        |                      | 1     | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   |
| X your compliance   | Y tax guidance         | Tax documents        | 10    | 1   | 3   | 4   | 4   | 1   | 2   | 29  | 48  |
|                     |                        | Expense tracking     | 3     | 0   | 6   | 4   | 14  | 1   | 3   | 22  | 113 |
|                     | Y organization help    | Reports              | 16    | 29  | 22  | 5   | 23  | 37  | 19  | 162 | 11  |
|                     |                        | Document Storage     | 2     | 6   | 6   | 3   | 8   | 51  | 3   | 11  | 14  |
| Y expert advice     | Accounting             |                      | 3     | 2   | 10  | 8   | 73  | 4   | 6   | 43  | 14  |
|                     | Y payment              | Invoices             | 22    | 3   | 12  | 1   | 1   | 0   | 293 | 1   | 10  |
|                     |                        | POS Payment          | 16    | 1   | 7   | 4   | 2   | 0   | 17  | 2   | 3   |
|                     |                        | Expense tracking     | 1     | 4   | 49  | 5   | 39  | 5   | 4   | 8   | 74  |
| Y organization help |                        | Reports              | 4     | 8   | 32  | 2   | 9   | 3   | 5   | 31  | 25  |
|                     |                        | Insights             | 0     | 0   | 3   | 0   | 7   | 3   | 0   | 7   | 2   |
|                     | Y inventory management | Manufacturing        | 1     | 3   | 1   | 1   | 2   | 244 | 1   | 3   | 3   |
|                     |                        | Sales                | 1     | 3   | 27  | 6   | 11  | 15  | 16  | 20  | 26  |
| Y expert advice     |                        | Bookkeeping          | 4     | 1   | 11  | 15  | 149 | 1   | 2   | 17  | 25  |
|                     |                        | Capital              | 6     | 0   | 2   | 74  | 1   | 1   | 0   | 1   | 0   |
|                     | Y funding              | Short-term loan      | 5     | 0   | 0   | 175 | 0   | 0   | 0   | 0   | 0   |
|                     |                        | Credit               | 2     | 1   | 0   | 48  | 2   | 1   | 3   | 0   | 1   |
| Y banking services  |                        | Money movement       | 32    | 0   | 209 | 39  | 20  | 1   | 13  | 14  | 15  |
|                     |                        | Crypto management    | 1     | 0   | 1   | 0   | 1   | 1   | 0   | 1   | 1   |
|                     | Y payroll              | Employee payment     | 252   | 37  | 1   | 1   | 1   | 0   | 5   | 3   | 1   |
|                     |                        | Payroll taxes        | 6     | 5   | 3   | 0   | 1   | 0   | 0   | 2   | 10  |
| Y benefits          |                        | Healthcare           | 5     | 0   | 2   | 0   | 1   | 0   | 0   | 0   | 0   |
|                     | Y organization help    | Time tracking        | 7     | 290 | 1   | 1   | 3   | 14  | 7   | 12  | 3   |
|                     | Y expert advice        | Workforce consulting | 2     | 7   | 2   | 5   | 29  | 18  | 2   | 12  | 2   |



Mixed methods concept testing of in-browser AI tool

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# Mixed methods concept testing of in-browser AI tool

## The client

BetaCo: A Senior Project Manager implementing new in-browser AI tools for a major internet browser for a Fortune 10 tech company

01

## Context

The client was anxious about the AI landscape, especially how stand alone Generative AI apps compete with in-browser AI tools, like AI-generated summaries. Given the crowding playing field and novelty of AI solutions, this stakeholder wanted to know *everything* and fast.

02

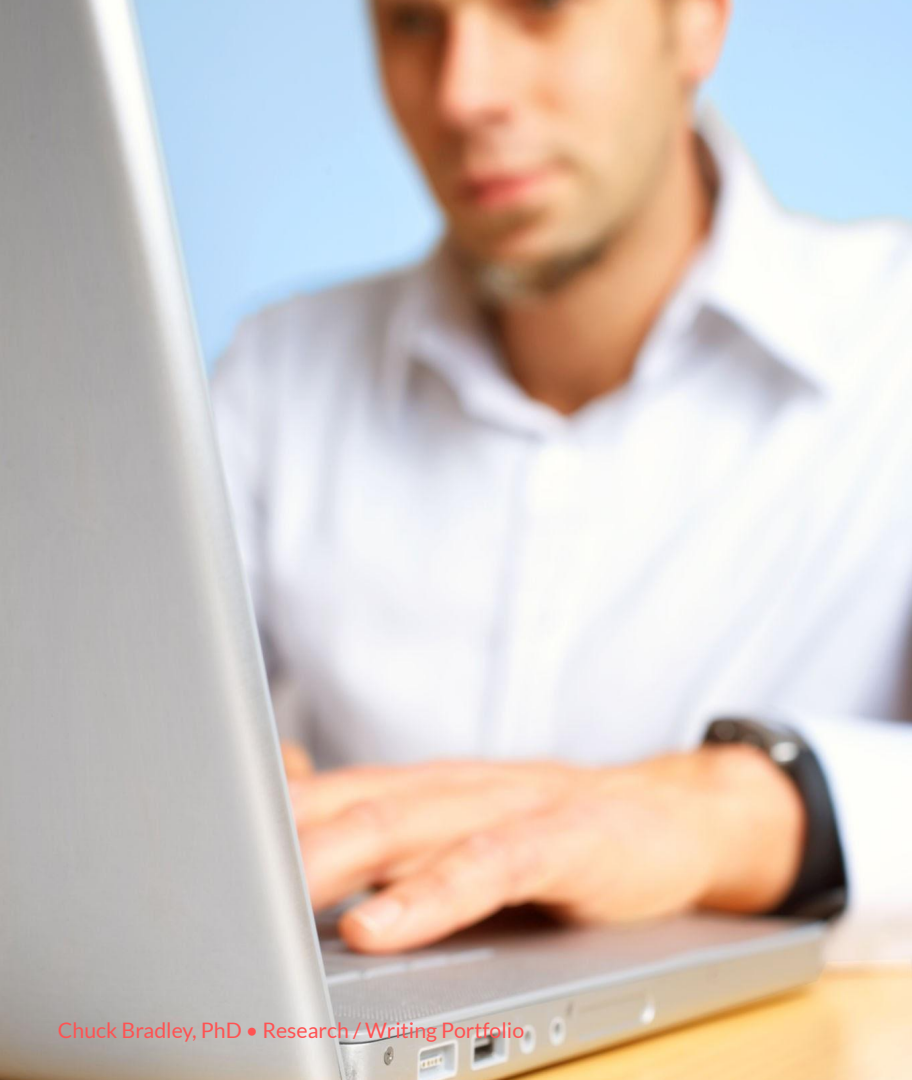
## Issue

How can the browser boost engagement and growth for AI tools in the browsing experience?

03

## The ask

- Quantitatively and qualitatively...
1. Identify potential opportunities for our AI tool and browser to improve the GenAI + browser experience
  2. Explore hypothesized AI tool + browser opportunity and dig sites
  3. Determine the direction for integrated AI tool + browser experience that encourages wider adoption



# The solution

**Instrument:** Because of the relative “newness” of the AI-tool’s implementation into the browser, there were few *a priori* assumptions about what pain points and opportunities exist. To that end, we deployed a two-pronged sequential qual-quant attack to obtain a depth of understanding and then to measure it at scale:

Qual\*: Sixteen 60-minute online in-depth interviews with AI-tool users

Quant: Fifteen-minute online survey of 5,001 browser/AI-tool users, cut for generation, browser use (e.g., primarily Chrome, Edge, ...), AI tool use (e.g., primarily ChatGPT, Claude, ...), and affinity towards AI.

**Timeline:** 8 weeks

**My role:**

1. Client communication (w/ team)
2. Quant survey development
3. Quant data analysis
4. Integration of Qual & Quant results, story-development & visualization (w/ team)

\*the following slides only detail my contributions: the quant analysis and integrated report

# Aligning on key issues



*Client on fishing expedition, c.2025*

## Client wishlist

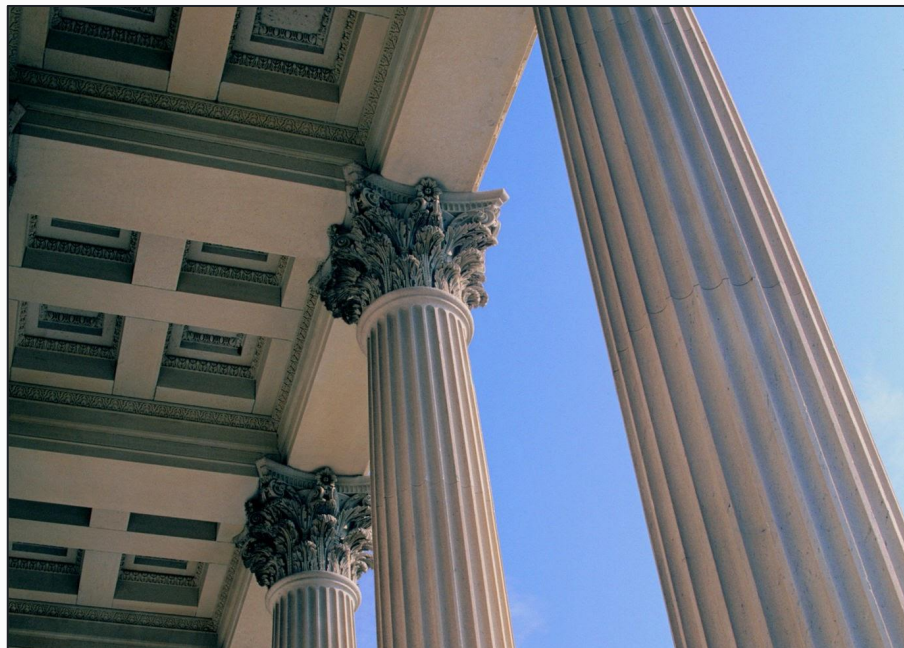
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The client brought with him a research plan that included a competitive audit, concept testing, and usage analysis among other methods--way too much for a single study.

Through close partnership, I successfully negotiated a much more targeted jobs-to-be-done (JTBD) framework that answered his underlying core question: *What does a browser-based Gen AI tool need to do to succeed?*



# Reporting strategy



## Pillars & tenants

---

We tackled this broad question, *What does a browser-based Gen AI tool need to do to succeed?*, in 4 steps, each with their own sub-questions\*

\*questions below are illustrative only

01

### The state of the AI User

- Which AI tools are users engaging?
- How are they engaging them?
- Where and for what?

02

### The state of client's product

- Who is/isn't using our product?
- On what devices is our product used?
- In what context?

03

### Pain points and opportunities

- What makes AI tools enjoyable/ difficult to use?
- What opportunities are there to improve?

04

### Concept test

- Will our new AI-in-browser concept keep current users and attract new ones?

# Takeaways from 1,000ft

## For the busy Project Manager

With over 5,000 participants from all walks of life, we have a massive amount of data to present. But, this ice-breaker slide gives the busy project manager a sense of what's important:

1. Our current strengths
2. Our current challenges
3. Our next steps



### 1 | Learning & Discovery

At this stage in their AI adoption journey, AI Users need better ways to get educated, especially on what is possible with AI, to increase their confidence and frequency.



### 2 | From Work to Personal

Our strength today is in the Work setting. We will need to encourage more personal use cases with our tools. Consider using a work-personal split to introduce the value of agentic.



### 3 | The Mobile Experience

Our strength today is in the computer format. We will need to improve our user experience on mobile, and help AI Users understand the value of browser embedding over going to an AI App.



### 4 | Personalize & Customize

AI Users are in need of control over how their AI Tools interact with them and the nature of its outputs. We will need to build in settings that give our users this control.



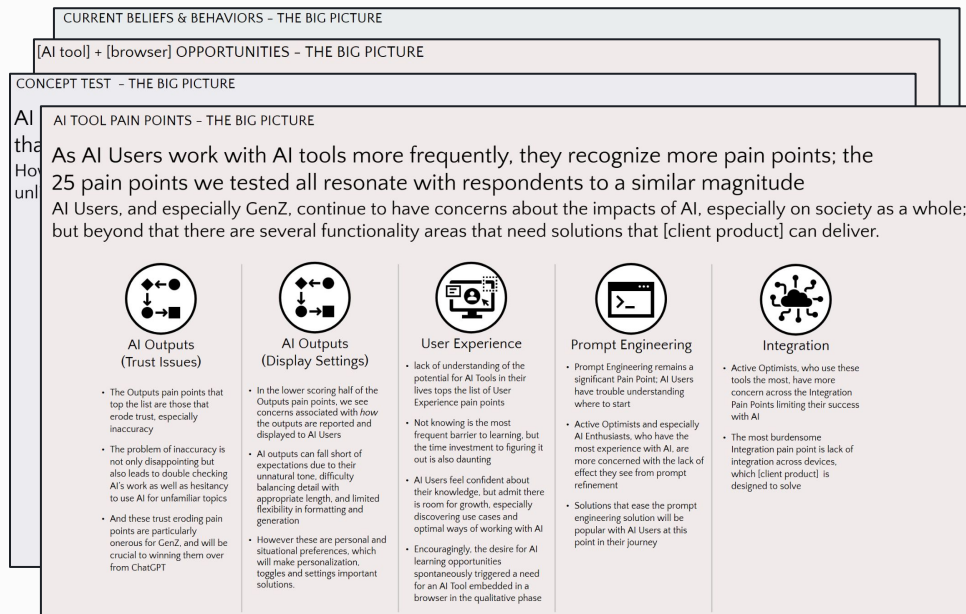
# Peeking through the clouds

## Pillar summaries

We start gradually adding more depth by summarizing the main takeaways from each pillar.

The summaries not only give a quick look at users, behaviors, and needs, but also identify where the client's product succeeds and where further work needs to be done.

Through close, iterative partnership with the client, we front-loaded the information most relevant to the product team (design, innovation), senior leadership (strategy), and other interested parties.



# AI user manual

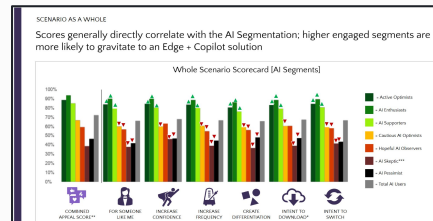
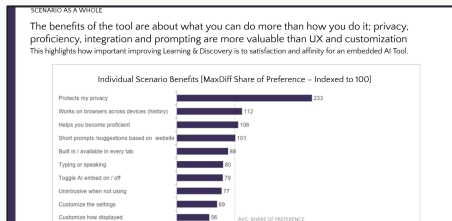
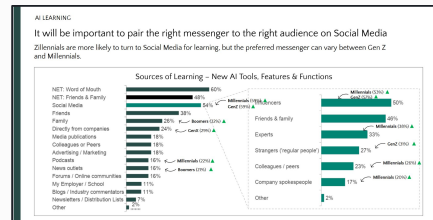
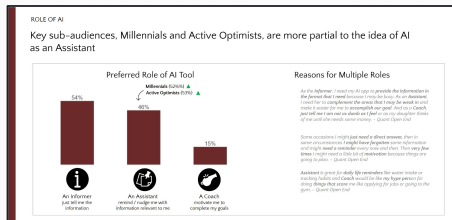
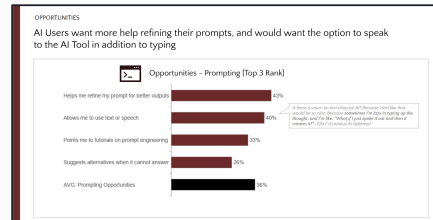
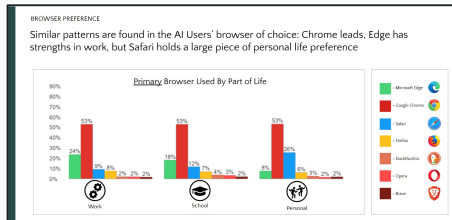
# The Official Playbook™

We collected a lot of data from a lot of different users--spanning generations, attitudes towards AI and other behavioral and demographic factors.

**Potentially, everything is relevant!**

In addition to reporting our top-level findings and recommendations, we prepared a detailed, 150-slide user manual on how to understand the needs, thoughts and behaviors of current and potential AI users.

While my team offered long-tail support on this project, the User Manual allowed the client to self-serve on new questions, grab ready-made slides for product discussions with the broader team, and have the information critical to innovate, refine and launch new products at their fingertips.



# Concept test in focus

Pillar 4 was a concept test, which involved one “product” with a few different features to explore.

The next several illustrate our storytelling around the concept as a whole. Then, the final slide in this section shows how one particular feature was evaluated.

(Select) Exercises:

1. Ratings (KPIs)
2. IDIs
3. Highlighter task
4. MaxDiff



AI Users, especially Millennials give the hypothesized scenario high scores, indicating that this enhancement will support retention and preference. However, Non-AI Users are not there yet; they are much less likely to find the scenario appealing, therefore this is unlikely to be a new-AI User acquisition tool.

### THE BROWSER

- AI Users agree, embedding an AI Tool in the browser leads to even more 'easier to use' AI
- Greater ease of use comes from a combination of benefits tied to embedding:
  1. Embedded in the Browser
  2. No Switching Between Tabs
  3. Integration Across Devices
  4. Knows Context from the Website

### BROWSER WATCHOUTS

- All of this access and integration does raise privacy and security concerns, it will be important to highlight privacy and security toggles, controls and guarantees soon after introducing this scenario to users
- Tutorials are somewhat interesting to users, as long as they are short, targeted and if they ask. However, Prompts & Nudges are more interesting learning opportunities that require less effort from the user
- Because of browsing and AI habits on phones vs. computers, this feels like a computer solution. We will need to consider how to translate the scenario to a phone-format

### QUICK ASSIST

- Quick Assist eases initial concerns around an AI embedded browser's potential obtrusiveness, however, some feel that for it to truly be nonintrusive they would need the option to completely disable it for heads-down time
- AI Users appreciate the flexibility of being able to reposition the AI chat window, though there is a preference for accessing the AI Assistant on the right side of the webpage
- Due to long-time offerings like Alexa, talk is expected, especially on mobile interactions
- Tailored suggestions feels more conversational, closer to an assistant than just Q&A, and they also begin to address some of the pain points around prompt engineering

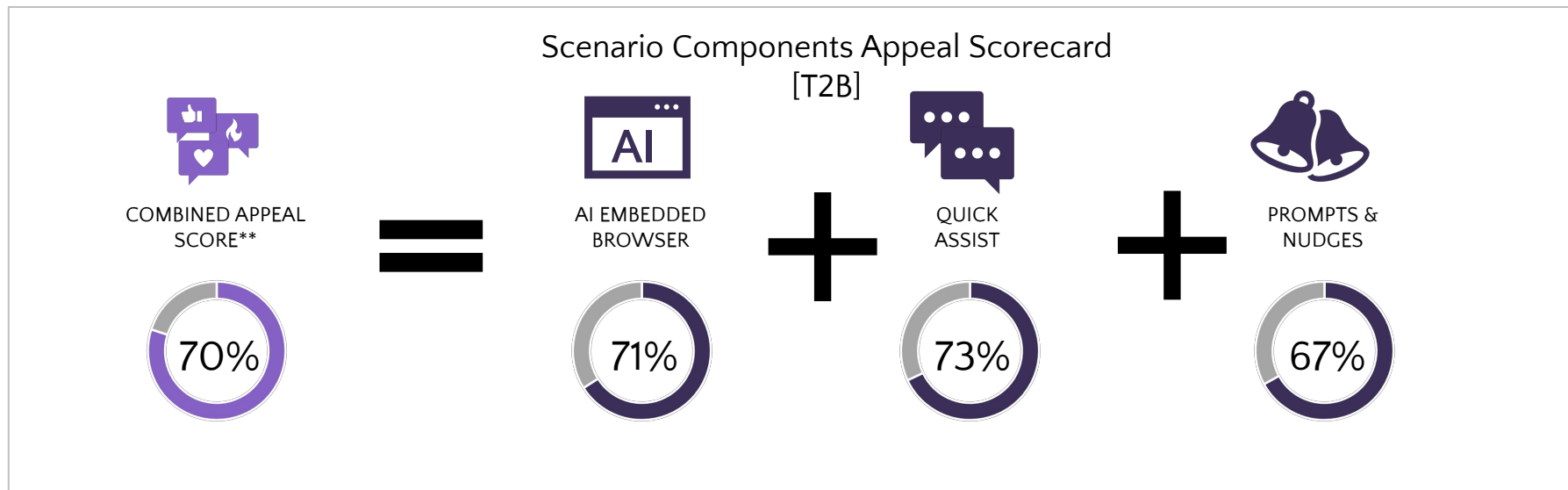
### PROMPTS & NUDGES

- Prompts & Nudges (P&N) goes a long way to improving the Learning & Discovery pain points
- However, as with all recommender widgets, the key is balance and relevance in that moment
- Each of the P&N examples plays a role in bringing the whole scenario and its benefits to life:
  1. Podcast Illustrates Discovery
  2. Tracking Prices Illustrates Advanced Search
  3. Art Project Illustrates Context

### PRIORITIZING OPPORTUNITIES

- The benefits of the tool are about what you can do more than how you do it; privacy, proficiency, integration and prompting are more valuable than UX and customization
- This highlights how important improving Learning & Discovery is to satisfaction and affinity for an embedded AI Tool
- Overall, AI Users are left with a positive impression of the scenario and can easily imagine its value add to their journey of AI discovery and growing their expertise

The hypothesized scenario scores strongly on appeal across its component parts



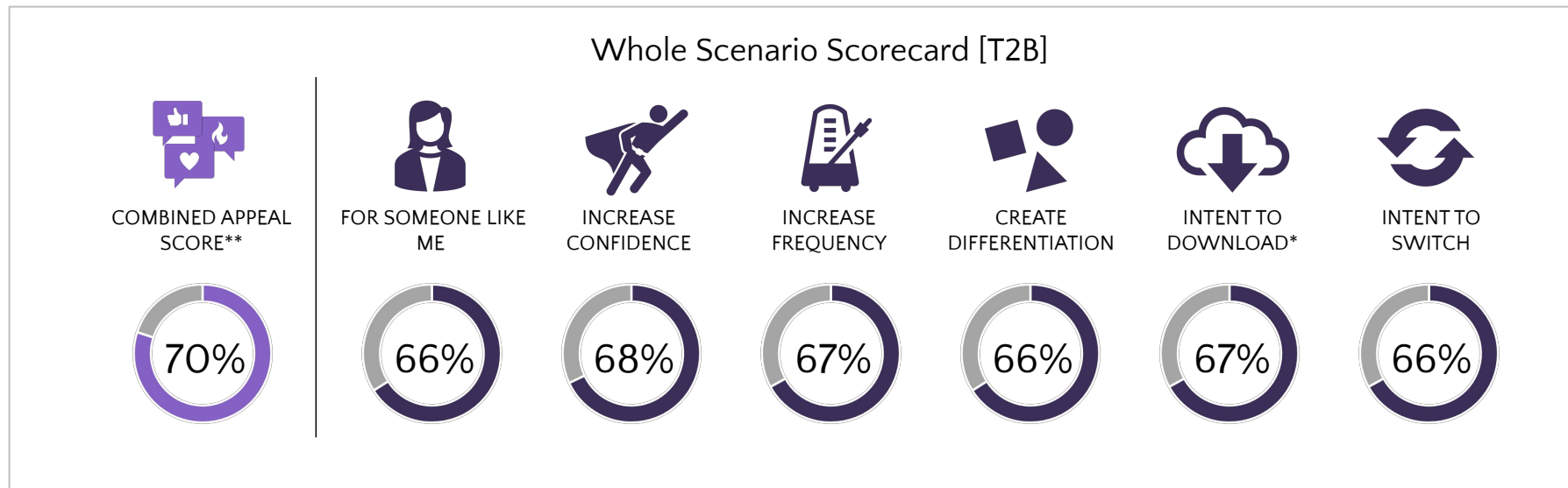
Q: Considering these all together as a single browser idea. Please rate the following statements according to how much you agree or disagree based on the entire idea as a whole.

Please rate this statement according to how much you agree or disagree. The browser is appealing to me

N: AI Users (3,569)

\* Not explored in qualitative phase \*\* Average of all three pieces of stimulus (Appeal of Browser + Appeal of QA + Appeal of P&N)

In fact, AI Users give the scenario high scores across the board, indicating that this enhancement will support retention and preference among AI Users



Q: Considering these all together as a single browser idea. Please rate the following statements according to how much you agree or disagree based on the entire idea as a whole.

Please rate this statement according to how much you agree or disagree. The browser is appealing to me

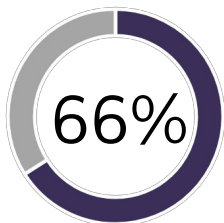
N: AI Users (3,569)

\* Not explored in qualitative phase \*\* Average of all three pieces of stimulus (Appeal of Browser + Appeal of QA + Appeal of P&N)

Respondents can easily imagine themselves using an AI enabled browser like this one, however it does not feel personalized enough to truly be 'for them'



FOR SOMEONE  
LIKE ME



It fits with their AI in browser needs, and they can see it leading to a more seamless experience while addressing some of the challenges around discovering uses cases.

*That would solve one of my main struggles now because I just don't know some of the capability. I was not raised on AI. My brain is not like I'm going to use AI for that.*  
- Rachel Z (AI Enthusiast)

*This is the perfect AI tool for me. I think it's going to be very helpful in my future endeavors on the internet and the browser.*  
- Dee J (AI Enthusiast)

*I'm all for simplicity, productivity, efficiency, which I think this is exactly what it can do.* - Gene K (Cautious AI Optimist)

However, it feels like it would be just as helpful to anyone, lacking features that convey a more bespoke or personalized experience.

*I think anyone could use it. I don't think it's just made for me? I think anyone could pick up and use it.* - Christy S (Cautious AI Optimist)

*I would probably just say it's a 3 [out of 10]. Because if it's for me or if it's bespoke or if it's something custom, I feel like I would ask for it first, but I didn't ask for it, so I'm not sure if it's exactly for me.*  
- Jack L (AI Enthusiast)

Aaron L (Cautious Optimist)

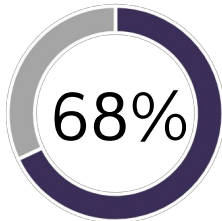


(click to play video, transcript in slide notes)

Reactions to it increasing their confidence depends on their confidence before seeing the scenario; they're either looking for more ways to use AI or are already satisfied



INCREASE  
CONFIDENCE



Some imagine that the discoverability that this scenario offers will naturally increase their confidence as they uncover more use cases and applications.

*It will help show you and help you discover different ways that it can be used, which would help me feel more confident with using it. It would help you figure out what you don't know because you don't know it, but it knows it.* – Rachel Z (AI Enthusiast)

*Basically, I was like, "Wow, well, if it made those kind of suggestions, it makes me want to think about using AI more for the same reasons." Maybe it would give me other suggestions for other ideas.* – Aaron L (Cautious AI Optimist)

*Knowing that AI is there as a support and friend would make me feel even more confident. And having it embedded in the browser when I'm doing my daily searches would increase my confidence as well.* – Dee J (AI Enthusiast)

Others feel they are already so confident in their AI skills that an AI embedded browser would do little to bolster this confidence even further.

*I don't feel like I'm bad at using AI because it's really just asking it questions. I don't think this would make me feel like, 'Oh, I'm better at using AI.'* – Landon B (Cautious AI Optimist)

*I'm pretty confident, since I already know about it, I guess it's just a different way to use it.* – Amelia V (Cautious AI Optimist)

*I'm fairly confident. This doesn't change it one way or another. I'm confident I would be able to figure out if I needed to which prompts to use eventually.* – Gene K (Cautious AI Optimist)

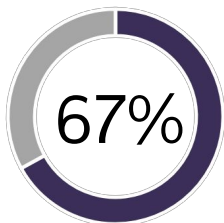
*I don't think it personally it increases my confidence at all. But I can see that the question is probably just catered towards someone who doesn't use AI too often.* – Jack L (AI Enthusiast)



## Respondents agree that having an AI that's embedded in a browser and surfaces suggestions or prompts would increase their AI in browser usage



INCREASE  
FREQUENCY



Having the icon present on any webpage they visit without having to open another tab will make using AI while browsing more top of mind and convenient.

*When it's staring at your face, you click. It will just give me the summary of everything I need to know in a step-by-step guide.* – Gene K (Cautious AI Optimist)

*This would increase the frequency I use AI because it's embedded in the browser and it's even more helpful than before.* – Dee J (AI Enthusiast)

*It's trying to make it more convenient to be able to use it and not have feel like, oh, here's the tab with the AI.* – Landon B (Cautious AI Optimist)

*It's like playing basketball with taller shoes. The aid is that everything's in the same place, it's going to push me to use it more.* – Eduardo D (AI Enthusiast)

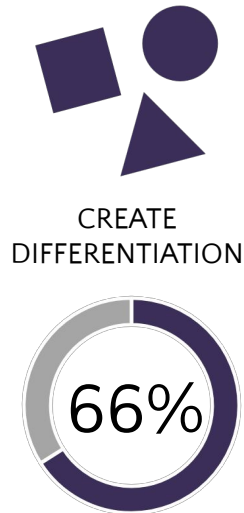
And they imagine the suggestions will add additional use cases to the ones that they are already doing increasing their breadth of usage.

*The more that I learn about it and the more that it can do, the more I'm going to use it. It's offering me more suggestions, and it's giving those little prompts. It's like "think about this."* – Christy S (Cautious AI Optimist)

*Some of the suggestions would be new to me and I'm sure there would be some that are pretty useful that I wouldn't have thought of. So, I would use it in a new way and probably more frequently.* – Peter S (AI Enthusiast)

*It would be suggesting things in real time. So, it would increase the frequency because then it would be suggesting ways that I wouldn't even have used it for previously. I'd still be using it for the ways I currently am and then in addition to things that it's suggesting.* – Rachel Z (AI Enthusiast)

Although not everyone is sure if AI enabled browser currently exist, consensus is that it will soon be tablestakes with every browser following suit



Many admit that they don't have a lot of experience in the realm of AI enabled browsers but imagine there are similar tools already out there or coming soon.

*I know that some of these things are out there. I don't know how new and different some of it is.*

– Christy S (Cautious AI Optimist)

*It's not something that I'm familiar with using and having used before, but it doesn't mean it doesn't exist.*

– Rachel Z (AI Enthusiast)

*I think I've seen it before. But I haven't seen it too often.* – Jack L (AI Enthusiast)

*It is different than what other AI Tools are offering, but I could also see Google Gemini snatching the idea and trying to do something very similar as well. So, while it is new, I can see other companies trying to replicate.*

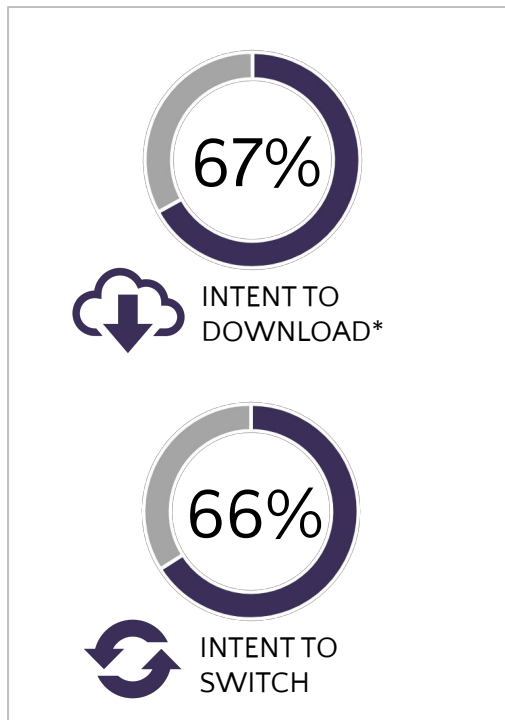
– Dee J (AI Enthusiast)

A few feel it's similar to what Google is already starting to do with Gemini.

*I think Google and others, they do offer something similar with the whole AI overview, they also have AI mode. But it almost sounds like it's describing what's there today. I'm not sure if I'm seeing any breakthroughs or anything new– Gene K (Cautious AI Optimist)*

*With Chrome, Gemini is all over the web pages. You just got to look for the little icon on it and then you could press it and then Gemini pops up. And I'm just like, "Oh my God, Gemini's been here this whole time and I didn't even realize Gemini was always here." That's why I'm just like, "I don't know." – Jacqui C (AI Enthusiast)*

While they express the intent to switch, reality is that browsers are very sticky so they may not end up following through on this intent



Our qual participants shared how onerous of task switching browsers is and that they already feel attached to their AI Tool of choice.

*No, I think I have too many bookmarks on Chrome that I'd be sad to leave.*  
- Jack L (AI Enthusiast)

*No, I'm just too tied to my browser.*  
- Amelia V (Cautious AI Optimist)

*I don't know if it'll become my primary tool, I'm just so used to it that it's really hard for another AI chatbot to come between me and my ChatGPT.*  
- Dee J (AI Enthusiast)



(click to play video, transcript in slide notes)

But some say they would be open to adopting it as a secondary browser to evaluate if the switch might be worthwhile after all.

*I would just figure out, "Hey, this better, it's an AI browser. How much of my data is it getting? Is there a feature where I can turn off that?" I would go through that process. As great as Edge is, and it's great, I don't see myself as missing out on something.* - Keith M (AI Enthusiast)

# Switching between tabs and transferring context from one tab to another is a pain point

## 2 No Switching Between Tabs

Having to switch between tabs and transfer context from one tab to another is a pain point in need of a solution.

*If it can take the information from across multiple tabs so that I don't have to extract all the bits and pieces that I'm explicitly looking for, that would save me 15, 20 minutes. – Peter S (AI Enthusiast)*

*I think it's a good idea because switching back and forth through different browsers is annoying. I have five different tabs open and now I'm looking back to the Chat GPT to compare. – Jacqui C (AI Enthusiast)*

*When I access Copilot and Edge, I have to open a separate browser. I have to open a new tab essentially to access it, which is annoying because then it's not embedded into everything I'm already doing. It's a step away. – Rachel Z (AI Enthusiast)*

*I think it's really cool. I like how it's convenient. I always have to look up ChatGPT, press it on the browser, and then it takes me to a thing and then I have to open another tab to actually get to the conversation. I can see why they're trying to make it an easier way to navigate for people. – Amelia V (Cautious AI Optimist)*

Eduardo D (AI Enthusiast)



(click to play video, transcript in slide notes)

Source: Qualitative Phase

This browser is appealing to me

71%  
[Top 2 Box]

### The Browser that Makes Using AI Easy

This browser is built to provide the easiest way to use AI for your web tasks. It features an AI companion that is seamlessly integrated into the browser and has a flexible layout in the browser that enables you to access it whenever you need it and allows you to customize how it looks to suit your workflow. You won't need to switch between devices or navigate away from the page you're on to engage with your AI, and it remains available across all open tabs.

Whether you're conducting research, creating content, exploring information, or seeking assistance with any task, it is there to lend a hand. You can type or talk to your AI, and it will get working for you. To help you discover additional ways it can help you in your daily routine, the browser will provide useful suggestions about additional tasks AI can do for you. It will also inform you when new capabilities and features with helpful tutorials to master your AI skills.

These same capability is also available on the browser for your mobile phone too.

|       |                    |
|-------|--------------------|
| 15%+  | 5-10% highlighted  |
| Words | Words = Positive   |
| Words | Words = Negative   |
| Words | Words = Polarizing |

Q: Please rate this statement according to how much you agree or disagree. The browser is appealing to me  
(scenario Highlighter Tool)  
N: AI Users (3,569)



Mixed methods message testing for new marketing strategy

[Back to menu](#)

# Mixed methods message testing for new marketing strategy

## The client

**GammaCo:** Major tech provider looking to target small-medium businesses (SMB) without alienating their Mid-market (MM) & Enterprise-level (LE) base

01

## Context

Buyers in Small Businesses have different priorities than Mid Market or Enterprise business; they wear a variety of hats and may have more complex roles. Their needs may not align with client's "IT First" approach to marketing for MM and LE.

02

## Issue

The client developed a refreshed value proposition for SMBs and several Growth Platforms that articulate this value prop. The client needed to make sure messaging resonates with and makes an impact on SMB decision-makers.

03

## The ask

Quantitatively and qualitatively...

1. Determine how to refine value prop, if needed, to maximize impact among Small Business.
2. Validate that the value prop is aligned with small business needs.

3. Determine if the Growth Platforms address the key needs of small business, and how to refine them.
4. Understand if Growth Platforms articulate and connect to the value prop.





# The solution

**Instrument:** We needed to know if our messaging strategy moved the needle with our new audience, Small Businesses, in the face of our competition. Further, we needed to understand why our messaging succeeds (or doesn't) to (1) make refinements and (2) guide 2026's messaging strategy beyond the messages tested explicitly in this program. To that end, we deployed a quant-qual program to deliver on measurement and refinement.

**Quant:** An online 20-minute survey of 1,800 Business Decision Makers (BDMs) and IT Decision Makers (ITDMs) in small and mid-market businesses in US, Germany, and India

**Qual\*:** 12 60-min video In-Depth Interviews (IDIs) among BDMs and ITDMs in small and mid-market businesses in the US

**Timeline:** 8 weeks

## My role:

1. Client communication (w/ team)
2. Quant survey development
3. Quant data analysis
4. Integration of Qual & Quant results, story-development & visualization (w/ team)

\*the following slides only detail the my contributions (i.e., the quant analysis and integrated report)

# Analysis plan

## Satisfying the brief with purposeful design

To get a read on *whether* and *by how much* the Value Prop resonates with SMB decision makers and reflects back on the client's brand, we devised the following plan of attack:

1. Pre-read on KPIs for client and key competitors– Awareness, Consideration, Preference & key brand metrics (trust, quality, premium, innovative)
2. Exposure to value prop, followed by ratings on the value prop's relevance, clarity, uniqueness, and impact/action.
3. Post-exposure read on KPIs– Consideration, Preference & key brand metrics (trust, quality, premium, innovative)

To address *why* the Value Prop succeeds and any potential refinements, we deployed a bespoke quantitative analysis of consumer verbatims...

01

**SMBs' attitudes towards tech, small business, and tech partnerships**

1. Agreement ratings
2. Importance ratings

04

**Reactions to Value Prop**

1. Scales: Relevance, likelihood to seek more info, clarity, ...
2. Open-ended response

Exposure to Value Prop

05

**KPIs: Client vs. Competitors (post-exposure)**

1. Brand perception
2. Consideration
3. Intent to purchase
4. ...

03

**KPIs: Client vs. Competitors (pre-exposure)**

1. Brand perception
2. Consideration
3. Intent to purchase
4. ...

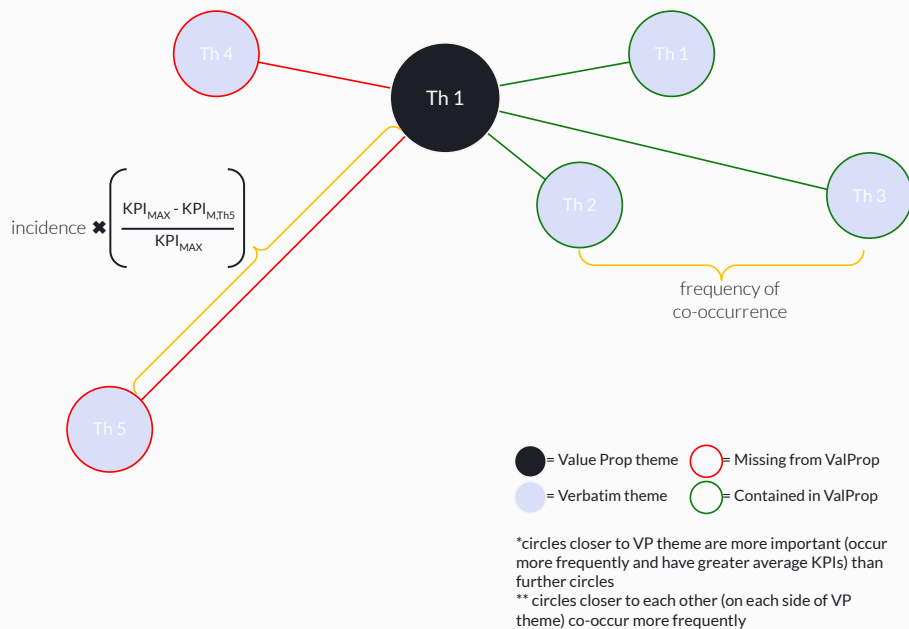
02

**Self-reflection on being a small business**

1. Open-ended questions



# Wringing nuance from a stone



## Quanting the qual to better understand our SMBs

We designed the quant survey to measure KPIs (e.g., *brand preference*, *consideration*, etc.) both pre- and post-exposure to the value prop and growth platforms to see whether messaging strategy boosted these figures.

However, the KPIs on their own don't tell us *why* the messaging strategy “wins”/“loses” or *how to refine it*.

To that end, we had participants describe what it meant to be a small business in their own words.

Using an AI-assisted thematic analysis, we captured and quantified key themes, including feelings of self-sufficiency, perseverance (in the face of larger businesses), and having a lack of resources.

We then performed a similar thematic analysis on the Value Prop itself. We triangulated the thematic analyses with the KPIs to learn how, whether, and why the Value Prop resonated.

# Reporting excerpt

The following slides are an excerpt from a larger report.

Slides [77](#) - [80](#): Getting to know SMB decision makers through their attitudes and needs

Slide [81](#): The stimulus (i.e., the Value Prop)

Slides [82](#) - [83](#): Measuring the impact of the Value Prop on [client]'s brand / perception

Slide [84](#) - [86](#): Using verbatims to target areas of improvement in Value Prop

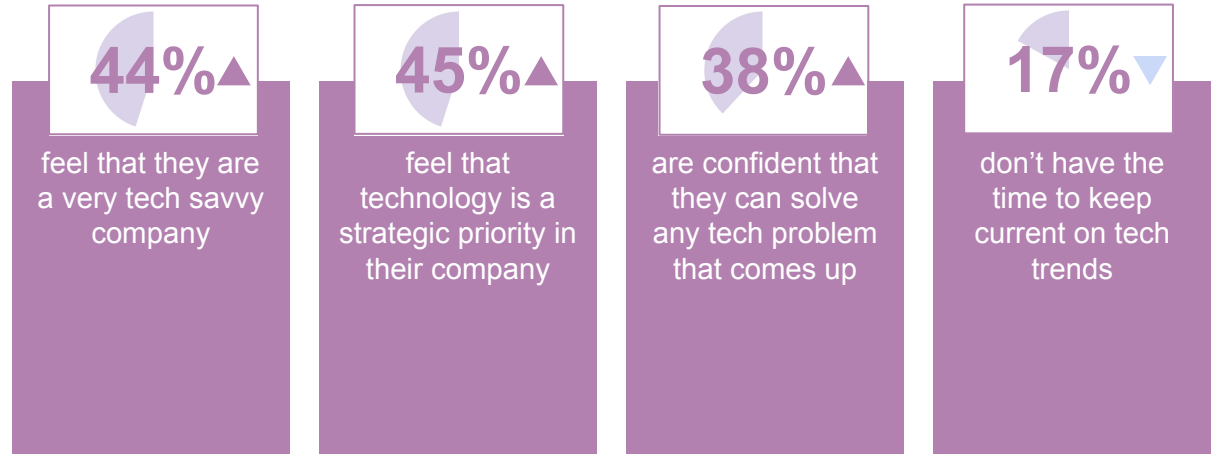
Slide [87](#): Revising the Value Prop revision based on learnings



# Many Small Businesses consider themselves to be tech savvy and keep up with current trends.

## Attitudes about Tech

There is a level of confidence and pride in being a small business decision maker. Lenovo will want to consider a tone that respects this sentiment and position itself as value-added partner to an already tech savvy customer.



% Strongly agree; \*Arrows indicate statistically significant differences from average

Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)

A2. How much do you agree or disagree with each of the following statements about the organization you work for? (For a full list of metrics, please see appendix.)

# Small Business decision makers are busy people, but they are not all proactively looking for guidance

## Attitudes about Business

These decision-makers have a lot to keep up with, but it's not necessarily a pain point: only about 1 in 3 feel they need more guidance. The exception is AI implementation.

It will take education about the value-added offer to convince them what we can provide.

42%▲

of Small Business decision makers say they 'wear many hats' in their organization

38%▲

say one person or department is responsible for IT purchasing for their whole company

32%▼

wish they had more guidance on what tech solutions / services would best support their company's growth

43%▲

feel that AI will be an important growth engine, but they need to know how to implement it

% Strongly agree; \*Arrows indicate statistically significant differences from average  
Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)

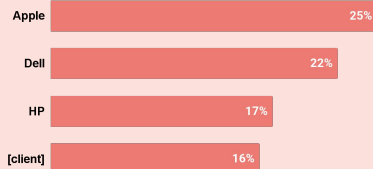
A2. How much do you agree or disagree with each of the following statements about the organization you work for? (For a full list of metrics, please see appendix.)

# Although they don't expect it from any tech provider, having a partner that understands their business needs is motivating

Tech providers are perceived to be mostly the same, but they're open to hearing from brands.

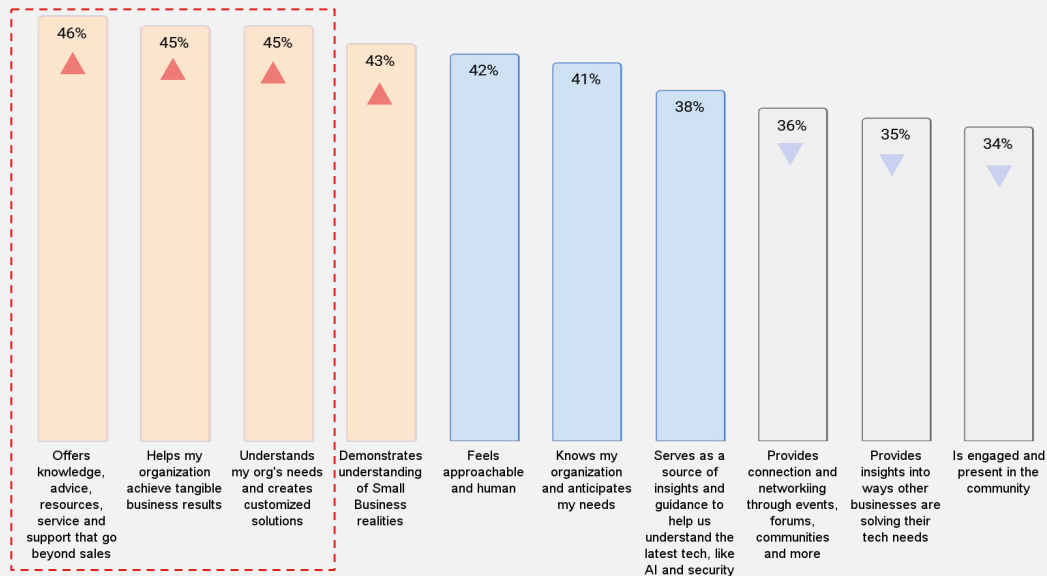
This opens the door for [client] to uniquely differentiate itself as a partner.

## Brand Preference\*



Only about 1 in 3 prefer to stick with tech brands they know.

## What do small business DMs need from tech providers?



% 'Extremely important', Arrows indicate statistically significant differences from average

Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)

A3. Think about what your organization needs when choosing a technology partner. How important are each of the following to your choice of which technology partner to work with?

\*Source: Brand Health Tracker\_B2B\_ITDM\_WW\_SMB\_Q4FY25

# Tech challenges are a top concern but with limited resources they typically navigate the solutions on their own



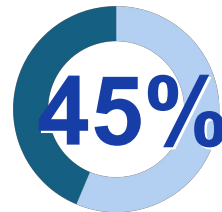
## Tech concerns

- Keeping up with new tech, especially AI
- Cyber-security
- Catering to the varying hardware needs of their employees
- Managing tech needs of a remote workforce
- Getting quality devices at a good price



For **guidance and support**, they need to take a more resourceful approach which includes:

- Reaching out to former colleagues and peers for advice,
- Researching on Google
- Attending webinars and occasionally conferences
- Subscribing to newsletters



Strongly feel that technology is a strategic priority in their company.



*I have contacts from my previous work experience and, some mentors that I run these things by. I also follow whatever is going on in the world."*

- SB, ITDM, United States



*I'd say right now my source of information is reading and studying what I find on the Internet about it."*

- MM, ITDM, United States



## What does this mean for the value prop?

We must **position Lenovo as an essential partner that helps them solve these challenges**; that **they too are deserving of outside support** so that they can compete in a tech-forward world.

Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)

A2. How much do you agree or disagree with each of the following statements about the organization you work for?

# The value prop, and supporting pillars, we showed Small Business decision makers

[Client] delivers the tech edge your Small Business needs to thrive — smarter, faster, and more secure focused on delivering real business outcomes.

We're more than a provider – we're your trusted partner, a business & tech advisor helping you grow, adapt & succeed in a rapidly changing world by offering end-to-end technology that is scalable, AI-ready, and focused on your specific needs.

---

## 01 Built for Business

- End-to-end offerings: laptops, desktops, workstations, smartphones, servers, software, services and accessories
- One of the most innovative tech portfolios in the industry
- Dedicated Small Business sales and support teams.
- Flexible pricing options to tiered membership and financing solutions

---

## 02 Powered by AI

- A global leader in AI
- We simplify AI so that it is personalized and learns user preferences
- Intelligent tools that help boost productivity, streamline operations, & improve decision-making through AI
- With our AI tools, drive growth, improve agility, & keep ahead of the competition.

---

## 03 Tailored for you

- Personalized technology recommendations based on your goals and challenges.
- Proactive support for early threat detection and compliance solutions
- Flexible & scalable, designed to grow with you.
- Small Businesses always-on guidance, exclusive offers, relevant resources, and lifecycle services

# We're at a good starting point: Our Value Prop lands well across markets and business sizes.

However, when tailoring the Value Prop, we'll need to push hardest on uniqueness

|                    |  |  |  |  |     |
|--------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|
|                    | Likelihood to seek information<br>(% 'Definitely will')                           | Uniqueness<br>(% 'Extremely new and different')                                   | Relevance<br>(% 'Extremely relevant')                                               | Clarity<br>(% 'Extremely easy to understand')                                       |     |
| Value Prop         | 46%                                                                               | 35%                                                                               | 43%                                                                                 | 43%                                                                                 |     |
| <hr/>              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |     |
| Supporting Pillars | Built for Business                                                                | 44%                                                                               | 31%                                                                                 | 41%                                                                                 | 42% |
|                    | Powered by AI                                                                     | 44%                                                                               | 34%                                                                                 | 42%                                                                                 | 42% |
|                    | Tailored for you                                                                  | 45%                                                                               | 32%                                                                                 | 40%                                                                                 | 42% |

Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)

B2: How relevant to your organization is this description of what Lenovo can provide? [Top box score]

B3: How easy to understand is this description of what Lenovo can provide organizations like yours? [Top box score]

B4: How new and different from other companies is this description of what Lenovo can provide organizations like yours? [Top box score]

B5: How likely would you be to seek information about Lenovo based on this description? [Top box score]

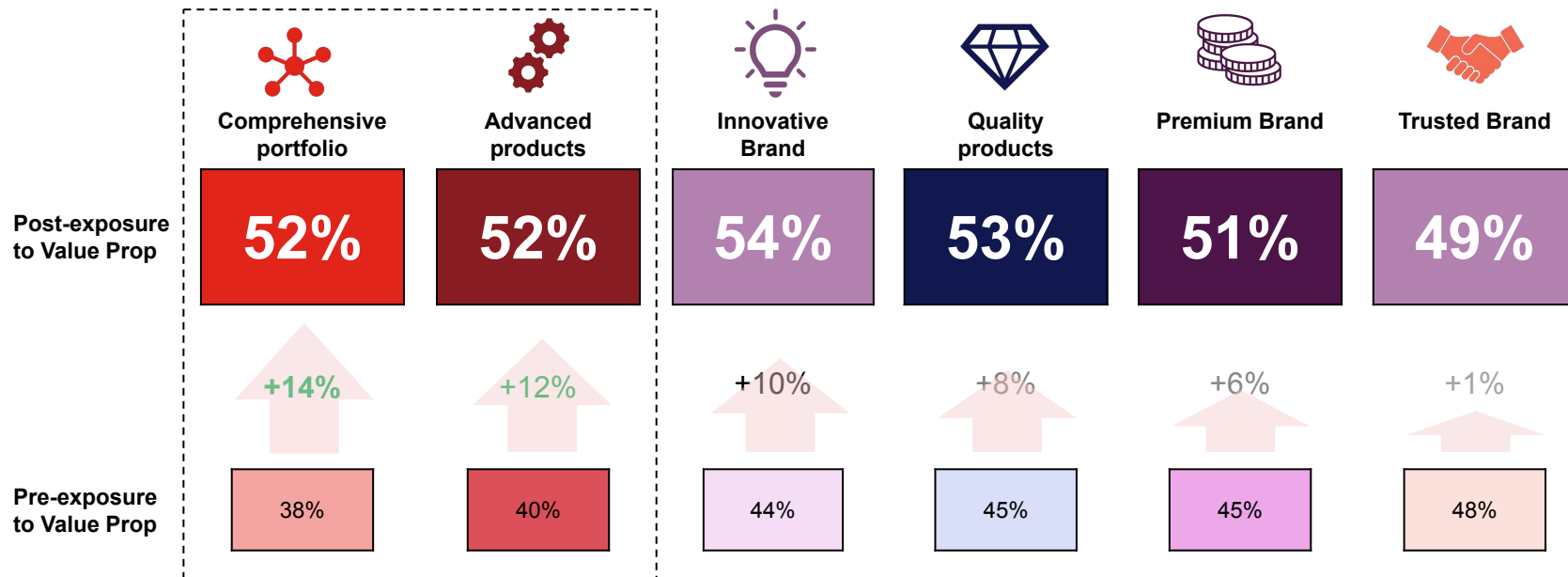
- The primary call to action is strong, indicating a high level of excitement about the offering
- All three pillars (Built for Business, Powered by AI, and Tailored for You) are compelling and essential to the overall offering
- But only 1 in 3 Small Business decision-makers feels the offer is 'extremely new and different' from messages they've heard from other providers



# Further, the value prop boosts perceptions of [client], particularly around its portfolio and advanced products

This shift in perception suggests that, before reading the value prop, consumers were not fully aware of all that [client] can offer beyond hardware.

## Perceptions of [client] pre- and post-exposure to the Value Prop (% strongly agree)



# Specific language acknowledging hardships that SMBs face meets decision makers where they are

## Value Proposition

[Client] delivers the tech edge your Small Business needs to thrive — smarter, faster, and more secure focused on delivering real business outcomes.

We're more than a provider — we're your trusted partner, a business & tech advisor helping you grow, adapt & succeed in a rapidly changing world by offering end-to-end technology that is scalable, AI-ready, and focused on your specific needs.

63%

conceptual alignment  
with decision-makers'  
view of SMBs

## The Val Prop aligns with how small business owners view their own struggles

01

"[SB] brings to mind startups, family-owned businesses, businesses struggling to survive, especially in harsh economic realities." — MM, BDM, United States

"...[SBs] make me think of family on a boat in the middle of the ocean, vice versa big companies have a cruise ship..." — SB, BDM, United States

"A growing company that requires a great deal of support to succeed." — MM, BDM, United States

## Explicitly, SMB decision makers call out key Val Prop themes as critical touchpoints

02

"I like that Lenovo presents itself as a true partner rather than just a vendor — SB, ITDM, United States

I like how it has the best interests for small businesses in mind and wanting them to grow and achieve great potential, I also love that they actually want to teach and help, not just make money off of small business. — MM, ITDM, Germany

The way it demonstrates that it committed to small businesses like us, like providing full end-to-end technology solutions, having a sales team specially for small businesses and their unique needs, providing scalable solutions for small [businesses] with flexible pricing — SB, ITDM, India

Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)

A2b: When you hear the term 'small business' what images, emotions, or ideas come to mind? (open ended responses)

B27a: What do you like about this description of Lenovo?

# Language surrounding partnerships delivers what SMB decision makers are searching for

## Value Proposition

[Client] delivers the tech edge your Small Business needs to thrive — smarter, faster, and more secure focused on delivering real business outcomes.

We're more than a provider — we're your trusted partner, a business & tech advisor helping you grow, adapt & succeed in a rapidly changing world by offering end-to-end technology that is scalable, AI-ready, and focused on your specific needs.

58%

of relevant comments mentioned partnership as something they liked about the value prop

The Val Prop aligns with how small business owners view their own struggles

01

"[SB] brings to mind startups, family-owned businesses, businesses struggling to survive, especially in harsh economic realities." — MM, BDM, United States

"...[SBs] make me think of family on a boat in the middle of the ocean, vice versa big companies have a cruise ship..." — SB, BDM, United States

"A growing company that requires a great deal of support to succeed." — MM, BDM, United States

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Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)

A2b: When you hear the term 'small business' what images, emotions, or ideas come to mind? (open ended responses)

B27a: What do you like about this description of Lenovo?

# We can't do it all, nor should we.

## Value Proposition

[Client] delivers the tech edge your Small Business needs to thrive — smarter, faster, and more secure focused on delivering real business outcomes.

We're more than a provider — we're your trusted partner, a business & tech advisor helping you grow, adapt & succeed in a rapidly changing world by offering end-to-end technology that is scalable, AI-ready, and focused on your specific needs.

**27%**  
conceptual  
misalignment with  
decision-makers' view  
of SMBs

Although prevalent and important, other common themes shouldn't be incorporated into our messaging strategy

03

"Small businesses face many problems, primarily due to their limited financial resources (due to marketing difficulties), brand weaknesses, and low labor attraction." — MM, BDM, Germany

"An organization with limited resources & limited staff members which has great ideas and looks to grow." — SB, BDM, India

"Small budget, small team, local mostly, poorly financed, not as respected." — SB, BDM, United States

Base: Total (n=1,773); United States (n = 600), Germany (n = 573), India (n = 600)  
A2b: When you hear the term 'small business' what images, emotions, or ideas come to mind? (open ended responses)

# Our Value Prop, reimagined into consumer-facing copy, better meets the expectations of SMBs without alienating larger businesses

As a small business, you are accustomed to doing more with less. At [client], we recognize and respect this mindset and work ethic, and we believe that you merit the attention, support, and resources that can help you achieve your goals.

With [client] backing your business, you'll get the technological advantage your small business ~~requires~~ deserves to prosper—delivering smarter, faster, and more secure solutions that drive meaningful business results.

We're more than a provider – we're your trusted partner, a business and tech advisor helping you grow, adapt and succeed in a rapidly changing world by offering:

- 3 • End-to-end technology—from hardware to software and including services and accessories—all from a single trusted provider and tailored to your individual business needs
- Technology services and AI expertise to help your business identify when, where, and how to leverage AI for optimal benefit
- 5 • Flexible pricing options to align with your budget
- ~~• Educational resources, industry best practices, and connection to businesses like yours around the world~~

1

2

4

1

Restating core truths relevant to their personal narrative in a way that recognizes and celebrates their efforts.

2

Reference to Growth Platform tagline. 'Deserves' instead of 'requires' respects their tech-prowess

3

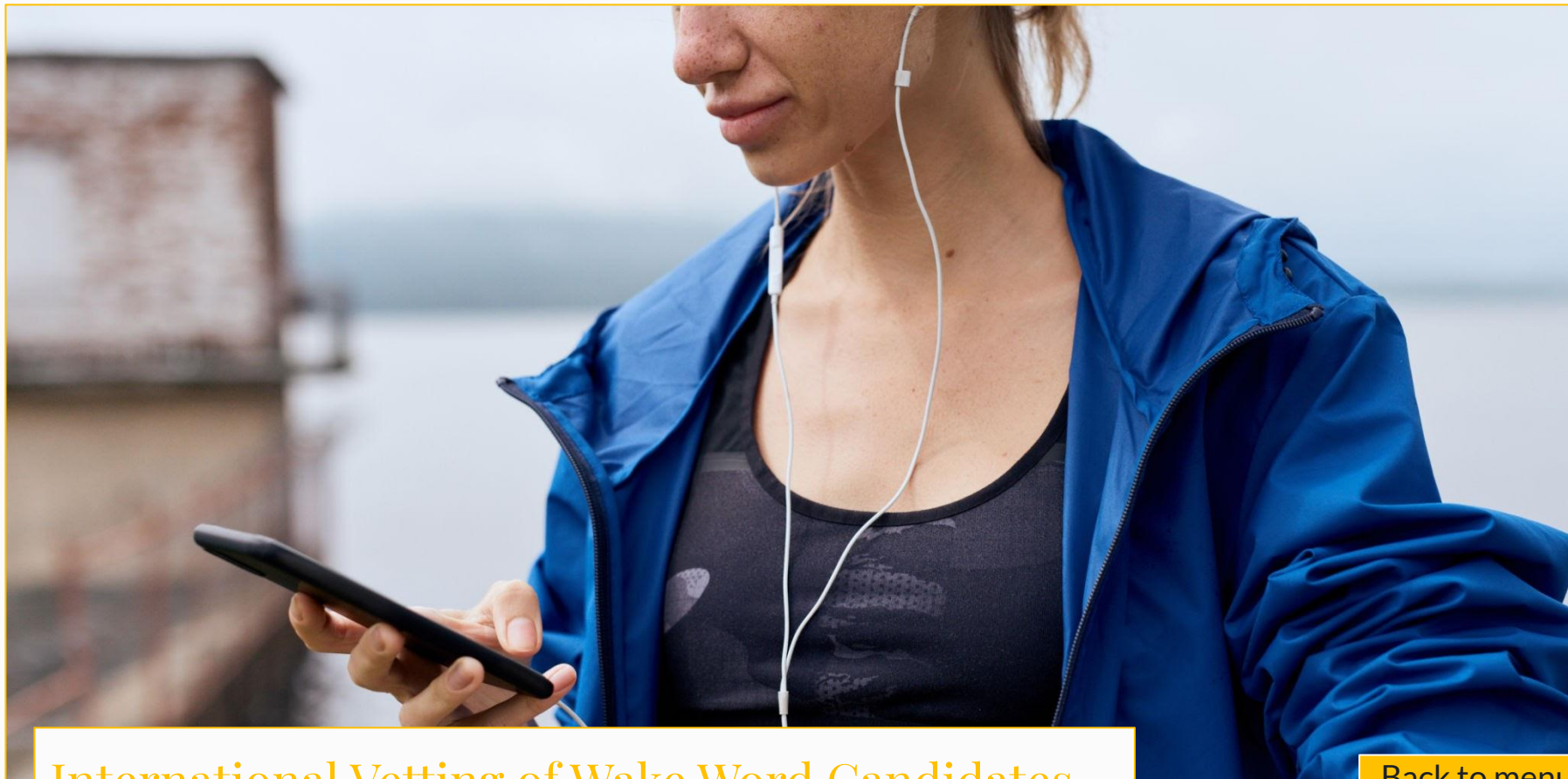
Added clarity on the breadth of Lenovo's portfolio to provide relevant context and credibility to our offer.

4

Mentions AI specifically and speaks to their immediate AI need of understanding.

5

Prioritize flexible pricing over educational resources.



International Vetting of Wake Word Candidates

[Back to menu](#)

# International Vetting of Wake Word Candidates

## The client

**DeltaCo:** Cross-functional product, engineering and UX team of a global Fortune 100 technology and social media company.

01

## Context

DeltaCo is developing a new digital assistant for their connected device ecosystem. For users to engage this new assistant with only their voice, the client needs a new “wake word” (think: “Hey, Siri!”, “Alexa”)

02

## Issue

There are a lot of moving pieces to naming a wake word:

Engineering needs something (a) easy for an algorithm to recognize but (b) distinct from everyday conversation (to prevent “false wakes”)

03

## The ask

Product and marketing want something unique, memorable and gender neutral

UX wants something easy and joyful to pronounce across the globe

1. Quantitatively evaluate wake word candidates in the US and 5 international markets
2. Linguistically evaluate wake word candidates in 19 languages



# The solution

**Instrument:** Getting the right wake word is a tall order, with potentially hundreds of millions of people using the word to activate their devices globally.

To understand “whether” a candidate succeeds, we deployed a quantitative survey. We focused respondents on a singular name per survey to extract detailed pros and cons of each name individually and to prevent unknowable methods of comparison between names.

To understand “why” a candidate succeeds, we developed a qualitative discussion guide for in-depth interviews with our team of in-country linguists/brand experts.

Quant: A online 20-minute monadic survey of 14,000+ respondents (28 candidate names X 100 participants per name X 5 international markets)

Qual: 19 In-depth interviews with our in-country linguists

**Timeline:** 4 weeks per round

## My role:

1. Client communication (w/ team)
2. Quant survey development, fielding and data analysis
3. Qual discussion guide development, IDIs, data analysis
4. Integration of Qual & Quant results, story-development & visualization (w/ team)



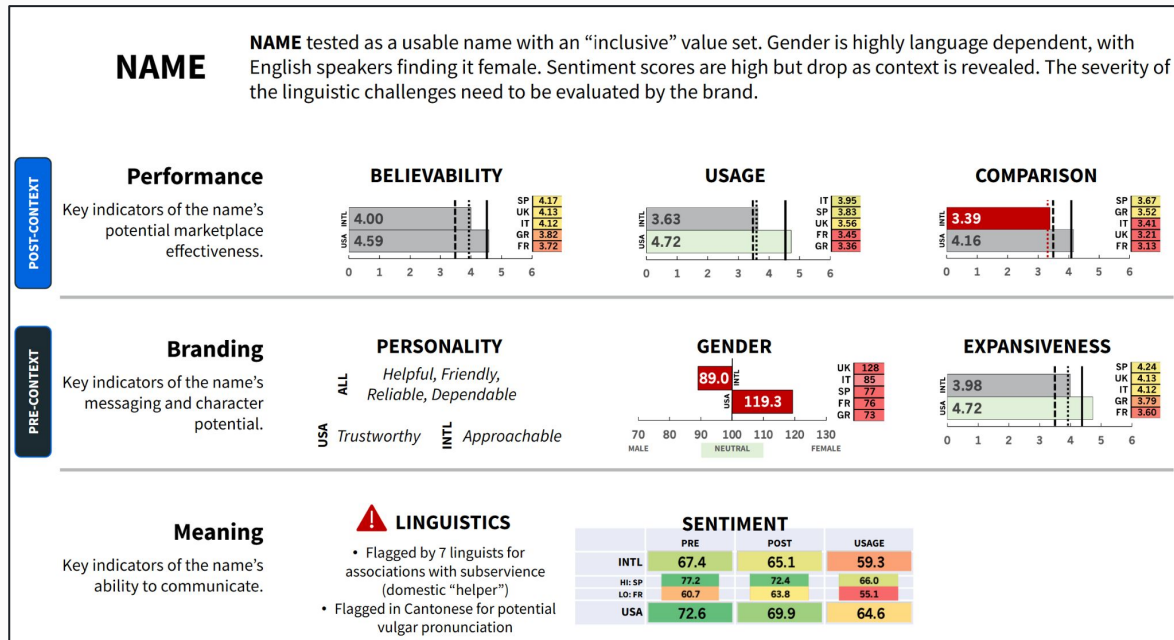
# Reporting approach

## “Scan or Study”

Summary slides must give the client team the option to scan for quick understanding or study to answer deeper questions.

A consistent layout with green/ grey/ red color coding and purposeful icons allow busy executive to compare between candidates at a glance.

The following 11 slides showcase results for one wake word candidate, codenamed “NAME”



# Project Objective

Leverage Lexicon's proprietary consumer research and WorldBrand® linguistic network to evaluate five potential Wake Words.

## Project Criteria

### Value Proposition

---

Does the Wake Word convey, “*Seamless connection to each other and the world?*”

### Signal [client]

---

The Wake Word needs to work within Meta and Meta's Metaverse.

### Be Natural

---

Do respondents find saying and using the Wake Word to be comfortable & easy?

### Gender Neutral

---

The Wake Word should avoid signaling an overly male or female persona.

### Convey Values

---

The Wake Word should be:

- Familiar
- Approachable
- Social
- Inclusive
- Imaginative
- Creative

## Tested by

- Believability
- Expansiveness
- Sentiment

- Believability
- Comparison
- Sentiment

- Usage
- Sentiment

- Gender
- Sentiment

- Personality
- Sentiment

# Collected data reports against this framework

All data in Tier One is Post-Context; All data in Tier Two is Pre-Context

POST-CONTEXT

## 1) Performance

Key indicators of the name's marketplace effectiveness potential.

### BELIEVABILITY

How believable is the name to the Value Proposition?

### USAGE

How comfortable is the name to say and use?

### COMPARISON

Measure the appeal of the name vs. competitive offerings like Siri & Alexa.

PRE-CONTEXT

## 2) Branding

Key indicators of the name's messaging and character potential.

### PERSONALITY

The intrinsic tone & vibe struck by the name.

### GENDER\*

Do people associate the name with a gender?

### EXPANSIVENESS

The favorability of the name prior to any context.  
*(Deemed of less importance for this descriptive name set)*

## 3) Meaning

Key indicators of the name's ability to communicate.

### LINGUISTICS

The name's ability to reach across 19 languages.

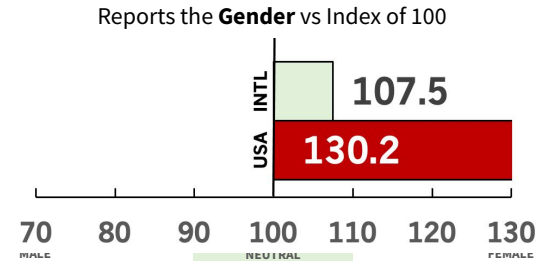
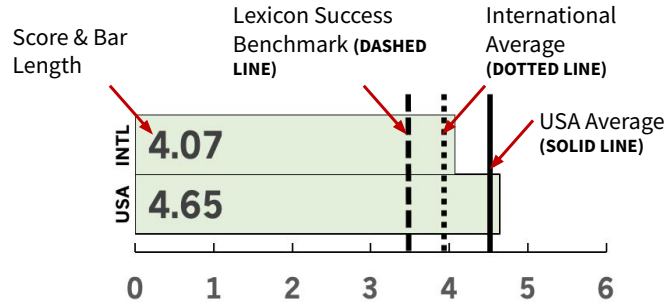
### SENTIMENT

The tone and direction of the open-end responses, both pre & post context.

\* **Gender** is comprised of 2 questions; one post & one pre. Average is shown, but all names in all markets moved slightly more feminine with context, likely due to today's marketplace of assistants (Siri, Alexa, etc.).

# Important note on data reporting

Instructions for evaluating data on the coming slides.



## Bar Colors



## Specific Country Findings

|    |      |      |
|----|------|------|
| IT | 4.17 | HIGH |
| SP | 3.80 |      |
| FR | 3.76 |      |
| UK | 3.44 |      |
| GR | 2.91 | LOW  |

## Country Abbreviations

|    |                |
|----|----------------|
| FR | FRANCE         |
| GR | GERMANY        |
| IT | ITALY          |
| SP | SPAIN          |
| UK | UNITED KINGDOM |

Reports the **Sentiment**, color coded to the respective International or USA average

|      | PRE  | POST | USAGE |
|------|------|------|-------|
| INTL | 66.1 | 65.4 | 57.0  |
| USA  | 70.4 | 69.8 | 69.0  |

(USA average is 66.4 out of 100 & International is 63.6; indicating the point when the respective numbers begin turning green.)

**All data:** N≈120/name/country

**NAME:** 2<sup>nd</sup> choice for an *easy, approachable, friendly* word that fosters social connections.

**NAME** evokes traits like *helpful, professional* and *reliable*; all words that convey [client] values. It delivers the project Value Proposition and performs at average in all markets for its overall contextual believability.

Respondents found it to be a comfortable, easy to say word, especially in the USA. In English-speaking countries, **NAME** reported as decidedly feminine but masculine elsewhere.

Linguistically, **NAME** suffers in Asian markets for being seen as derogatory and subservient; also mentioned in UK, FR & GR open-ends. In Cantonese it could be considered vulgar.

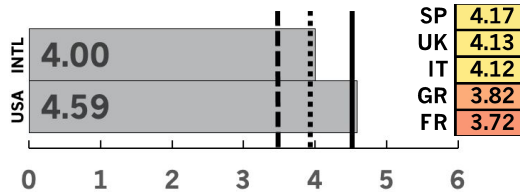
“**NAME** would bring people together rather than dividing them.”



# NAME: Performance

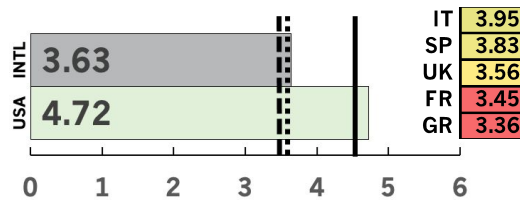
Key indicators of the name's potential marketplace effectiveness.

## BELIEVABILITY



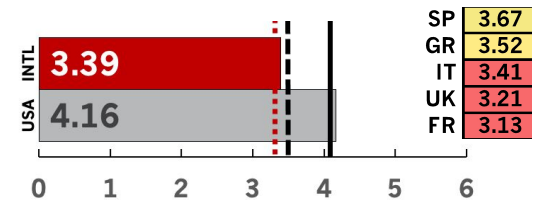
**NAME** performed at average in the fit of the name to the actual context.

## USAGE



**NAME** led the US field in the likelihood to use and ease of pronunciation with average International results.

## COMPARISON



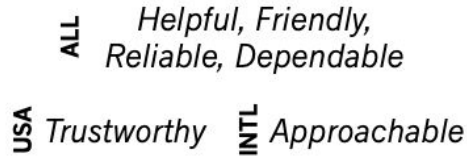
**NAME** performed at average in the competitive context of other digital assistants.

PERFORMANCE MEASURES ARE POST-CONTEXT

# NAME: Branding

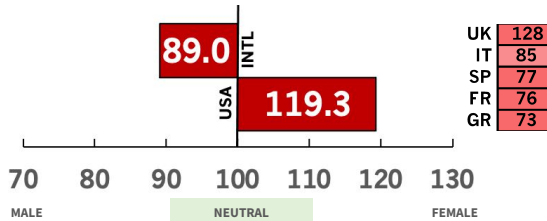
Key indicators of the name's messaging and character potential.

## PERSONALITY



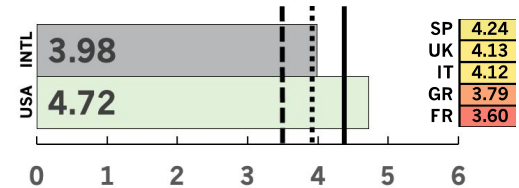
**NAME**'s personality traits feel like a good fit with Meta values.

## GENDER



**NAME** reports as a more feminine name in English-speaking markets and just-past Neutral for the other countries.

## EXPANSIVENESS



Pre-context, respondents found the idea of the word **NAME** favorable across all markets.

BRANDING MEASURES ARE PRE-CONTEXT

# NAME: Meaning

Key indicators of the name's ability to communicate.

## LINGUISTICS

### DETAIL

**NAME** surfaces Linguistic flags to evaluate:

- 1) Potential subservience or impoliteness
  - Flagged by 7 of 19 Linguists, in primarily Asian languages, for this association.
  - Like **NAME 2**, it was detected in UK, FR & GR verbatims
- 2) The Cantonese linguist flagged it for a pronunciation overlap with a vulgarity.

## SENTIMENT

|         | PRE  | POST | USAGE | TOTAL |
|---------|------|------|-------|-------|
| INTL    | 67.4 | 65.1 | 59.3  | 64.9  |
| USA     | 72.6 | 69.9 | 64.6  | 69.9  |
| SPAIN   | 77.2 | 72.4 | 66.0  | 73.1  |
| ITALY   | 67.2 | 64.6 | 64.9  | 65.7  |
| GERMANY | 66.0 | 63.8 | 61.3  | 64.2  |
| UK      | 66.0 | 61.3 | 50.0  | 60.9  |
| FRANCE  | 60.7 | 63.8 | 55.1  | 60.8  |

**NAME's** open-end comment sentiment was very strong, but dipped a bit as context was revealed.



# NAME

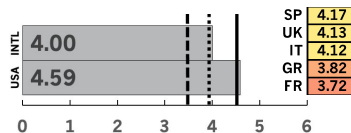
**NAME** tested as a usable name with an “inclusive” value set. Gender is highly language dependent, with English speakers finding it female. Sentiment scores are high but drop as context is revealed. The severity of the linguistic challenges requires further investigation.

## POST-CONTEXT

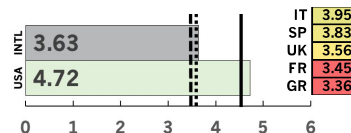
### Performance

Key indicators of the name’s potential marketplace effectiveness.

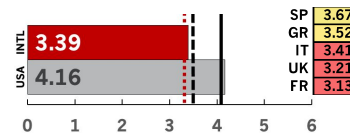
#### BELIEVABILITY



#### USAGE



#### COMPARISON

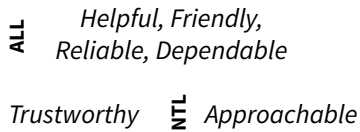


## PRE-CONTEXT

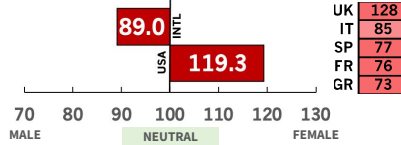
### Branding

Key indicators of the name’s messaging and character potential.

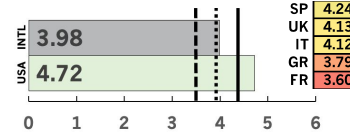
#### PERSONALITY



#### GENDER



#### EXPANSIVENESS



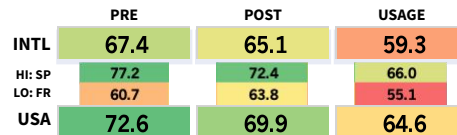
### Meaning

Key indicators of the name’s ability to communicate.

#### ! LINGUISTICS

- Flagged by 7 linguists for associations with subservience (domestic “helper”)
- Flagged in Cantonese for potential vulgar pronunciation

#### SENTIMENT



# EXTENSIVE LANGUAGE SCREENING



## POTENTIALLY SIGNIFICANT ISSUES: **NAME**

*“Hey, slut!”*

The **Cantonese** pronunciation of “**NAME**” is identical to an existing word: **NAME** /hau21 p<sup>h</sup>ɔ21/ “flirtatious woman; slut.” It would be uncomfortable or even vulgar to call on a digital assistant using this word.

*In-home caregiver*

The English word “**NAME**” has been borrowed into **Japanese** (**NAME** *herupā*) with a narrower meaning: “home caregiver for the elderly or disabled.” While not a negative word, this specific meaning will be prominent for Japanese speakers in the context of addressing a “**NAME**” and may be uncomfortable or inappropriate to use as a wake word.

*Domestic workers*

In multiple languages, the English word “**NAME**” is associated with (low-paid/immigrant) domestic workers, to greater or lesser degrees. (Detail next slide.)

## DOMESTIC HELPER: **Global Context**

Hong Kong, Singapore, and the Philippines seem to be the primary drivers of understanding “NAME” to refer to a low-paid immigrant housekeeper.

In Hong Kong and Singapore (where many domestic workers come from the Philippines), “a domestic” is the primary term for this category, and “NAME” is only used in this context. The term “NAME” carries a negative, low-status connotation:

“We are not slaves, we are workers,” one Filipina said [about “NAME”], echoing a rally cry used at local protest marches. Another said that the term “NAME” was “degrading.”

.... “NAME is more vulgar to pronounce,” said a woman in Central [Hong Kong]. “It has a low profile....”

– Hong Kong Free Press, “[redacted: news article]”, July 24, 2015

In any country that employs immigrant (especially Filipino/a) domestic workers, this connotation is possible. Further research is recommended to clarify whether this association poses any risk to the brand and what mitigation strategies are available.



Select brand / industry experience

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# Select brand / industry experience

Tech



Microsoft

Lenovo

intel®

Meta

SaaS



INTUIT  
mailchimp



intuit  
quickbooks®



Dropbox

FinTech /  
Financial

chime®



Fannie Mae®

VISA

CPG

pepsico

*The Coca-Cola Company*



Altria



PHILIP MORRIS  
INTERNATIONAL

# Select brand / industry experience

Medtech



Logistics /  
Energy



Travel /  
Leisure



Consumer  
/ Other





Writing: Academic, Professional, Full list of publications

[Back to menu](#)



# Writing samples

## Academic

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- [Visual form and event semantics predict transitivity in silent gestures](#)  
(*Cognitive Science*, 2023)  
**Highlights:** Experimental design, Quant analysis of qual data, Machine learning  
**Project code:** [GitHub](#) repository  
**My role:** ★ ★ ★ ★ ★
- [Visual form of ASL verb signs predicts non-signer judgment of transitivity](#)  
(*PLoS One*, 2022)  
**Highlights:** Data analytics, Experimental design, Machine learning  
Feature extraction / elimination  
**My role:** ★ ★ ★ ★ ★
- [Effect of sign language learning on temporal resolution of visual attention](#)  
(*Journal of Vision*, 2025)  
**Highlights:** Experimental design, Longitudinal study, Psychometrics  
**My role:** ★ ★

## Professional

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- [Halloween Horror Nights Softness report](#) for Universal Destinations & Experiences  
(Internal memo to stakeholders, 2024)  
**Highlights:** Data journalism, Survey research, Customer satisfaction  
**My role:** ★ ★ ★ ★ ★
- [Mobility as a Service Creates Significant Branding Opportunities](#) for Lexicon Branding  
(Company blog post, 2022)  
Note: Researched and written with colleague, Dr. Bryn Hauk. It is company policy to assign sole attribution to the CEO  
**Highlights:** Content marketing, Competitive analysis  
**My role:** ★ ★ ★

### Key

★ Project manager   ★ Research lead   ★ Writing lead  
★ Analysis lead   ★ Visualization lead

# Full list of scholarly work

## Journal articles, presentations, posters

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- Karabüklü, S., Wood, S. Sandra, **Bradley, C.**, Wilbur, R. B. , and E. A. Malaia (2025.). Sign language learning increases temporal resolution of visual attention. *Journal of Vision* 25(3). doi:<https://doi.org/10.1167/jov.25.1.3>
- **Bradley, C.** and Wilbur, R. (2023), Visual Form and Event Semantics Predict Transitivity in Silent Gestures: Evidence for Compositionality. *Cognitive Science*, 47: e13331.
- **Bradley, C.**, Malaia, E., Siskind, J. M. and R. B. Wilbur. (2022) Visual form of ASL verb signs predicts non-signer judgment of transitivity. *PLOS ONE* 17(2): e0262098.
- **Bradley, C.** (2022). Compositionality in 'Holistic' Pantomime Characterizes a Gesture-First Proto-Language. Talk presented at Expression, Language, Music 1 (August 20–22, 2022)
- **Bradley, C.** (2021). Top-down and bottom-up sources of meaning in silent gesture. Talk presented at *AMLaP 2021* (September 2–4, 2021)
- **Bradley, C.** (2021). Measuring encyclopedic content in silent gesture: Gesture not as vague as once thought. Poster presented at *AMLaP 2021* (September 2–4, 2021).
- **Bradley, C.** (2021). Systematicity in gesture production, perception may support sign language emergence. Poster presented at the CUNY Conference on Human Sentence Processing 34. Philadelphia, PA, US.
- **Bradley, C.** (2021). Structural iconicity in silent gesture. Poster presented at FEAST 2021. Hong Kong. June, 2021.
- **Bradley, C.** (2020). Evidence for argument structure in the form of pantomime. Poster presented at Experiments in Linguistic Meaning 1. Philadelphia, PA, USA. September, 2020

- **Bradley, C.** (2020). Evidence for subunit structure when gesturers communicate in/transitive actions. Poster presented at The CUNY Conference on Human Sentence Processing 33. Amherst, MA, USA. March, 2020.
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# Thank you!

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## A few words about me



# LEXICON®

**What I learned:** Consulting/ brand strategy, Qual & Quant surveys; How to apply NLP tools 'under the hood' without confusing clients

**Highlight(s):** Got buy-in from my boss to execute a new-to-us research methodology for an important FinTech client

## Where I've been:



**What I learned:** Advanced survey analytics; How to be heard in a large, matrixed organization (as a remote person at an in-person office)

**Highlight(s):** Learned two new-to-me advanced survey techniques in first months of employment

# STRAT<sup>7</sup> incite

**What I learned:** Forming trusted partnerships with clients; How to influence with no real power (driving from the passenger's seat)

**Highlight(s):** Forged meaningful connections with colleagues at a remote-first company; Met up in person with many!

## Games I'm playing right now:



## Favorite Free-time activity:

