

Data Science Manager - Takehome

This takehome includes two parts, first to analyze customer data and then to propose a followup experiment. Deliverable should be a document or notebook summarizing your findings and next steps. Any code you write for the analysis should also be included and clearly attached to your writeup. This entire takehome should take no more than 5 hours.

On the Data Science team we are tasked with improving the user experience from onboarding through to continued product usage. Attached are [three datasets](#) that cover:

- **organizations** - demographic features of the organizations on Mercury
- **adoption_funnel** - stage of overall adoption of Mercury from submitting an application through activation
- **product_usage** - information on each organization's usage of different Mercury products

See data definitions for more information about different aspects of the data.

Part 1: Review the data and summarize any core findings that you think would be valuable to the Experiences product team. Some examples of questions to think about:

- Which industries have the highest approval rates?
- Does growth potential affect likelihood to adopt different products?
- What does product churn look like?

The expectation is not to be able to answer every possible question, but instead to focus on a few key things that you think would be valuable. This assignment is intentionally open ended. In addition to your analysis include a description of a dashboard or app you would make that would allow for more self-serve of these kinds of questions.

Part 2: The Experiences team is considering a product update where we would feature products for different industries in the onboarding flow as a way to get earlier product adoption. The current proposal would have the featured product vary depending on the **industry_type** or **industry** of the organization. Based on your analysis of the data above, write up an experiment plan for this change. Topics to touch on include:

- Should we vary the product depending on **industry_type** or **industry**? If no, why not, if yes how should it be varied?
- What is the design of the experiment?
- How would you determine how long to run the experiment?
- How would you analyze the experiment results?
- What results would suggest what product followup action?

Appendix: Data Definitions

organizations

- *[primary key]* `organization_id` - unique identifier of the organization
- `industry` - one of several values that an organization can choose from when filling out the application to describe their business
- `industry_type` - a categorization of `industry` into groupings
- `segment_size` - part of our segmentation along two axes, size and growth potential, for size can be `micro`, `small`, or `medium`
- `segment_growth_potential` - part of our segmentation along two axes, size and growth potential, for growth potential can be `low` or `high`

adoption_funnel

- *[primary key]* `organization_id` - same as `organization_id` on `organizations`
- *[primary key]* `funnel_stage` - specific funnel point in adoption of the core banking product that is one of the following:
 - `application_submitted` - the organization submitted an application
 - `approved` - the organization's application was approved
 - `first_deposit` - the organization had their first non-\$0 balance (initial deposit to bank account)
 - `first_active` - the organization had 2 or more transactions in a 30 day period (same as definition of `is_active` for `Bank Account` in `product_usage`)
- `date` - date when the funnel stage was completed, can be `null`

product_usage

- *[primary key]* `day` - date of event
- *[primary key]* `organization_id` - same as `organization_id` on `organizations`
- *[primary key]* `product` - the specific product a user can adopt and use, includes:
 - `Bank Account` - All organizations get a bank account when their application is approved
 - `Debit Card` - All organizations can create debit cards for a checking account
 - `Credit Card` - Some organizations are eligible to create credit cards
 - `Invoicing` - All organizations can sign up to use the invoicing product
- `is_active` - whether the organization has used the product at least once in the last 30 days on a given day; "used" is defined as 2 or more transactions for `Bank Account` and 1 or more transactions for any other product

NOT TO SHARE WITH CANDIDATE

<https://metabase.internal.mercury.com/question/44094-data-science-manager-experience-s-takehome-data>

<https://app.hex.tech/45f2b9c2-d5b0-465c-8578-97967ccb5e32/app/f004733a-a2e1-442c-b08d-b4be074fd42e/latest>