

THE DATA CARDS PLAYBOOK

Activity Workbook

Participatory activities for purposeful, transparent, and people-centric dataset documentation





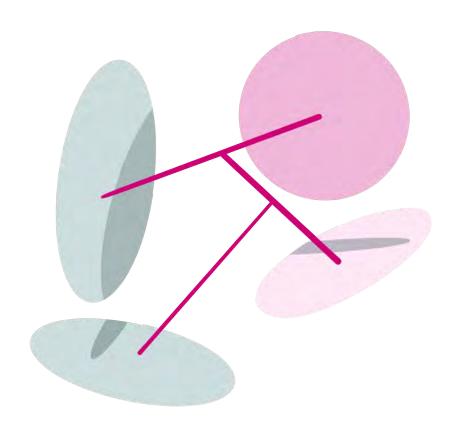
Align on Agents

Prerequisite checklist

BEFORE YOU BEGIN

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- → Read through Taxonomy of Stakeholders
- → Decide on your agents using Priority Matrix
- → Transfer results from above activities into the Activity Tracker for future reference

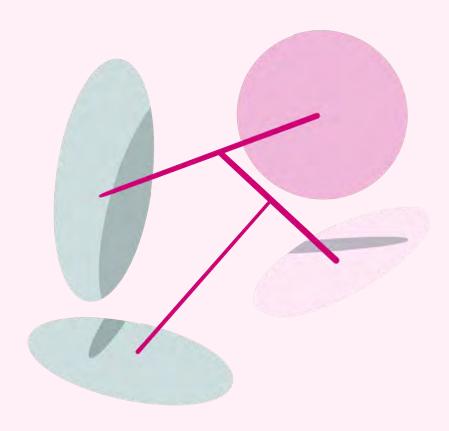


#datacardsplaybook

Align on Agents

Create personas for your top agents of your Data Card. Use these to guide your Data Card creation process.

- Articulate the diversity across your agents' background and proficiency
- Agents might review just the Data Cards, just the Dataset, or both
- Brainstorm how your dataset will uniquely address agent's needs



Complete the Align on Agents Persona Worksheet

Step 1: Assess your ranked list of agents. Make sure your group includes people that are familiar with the agent and the dataset

Step 2: Decide who will cover which agents

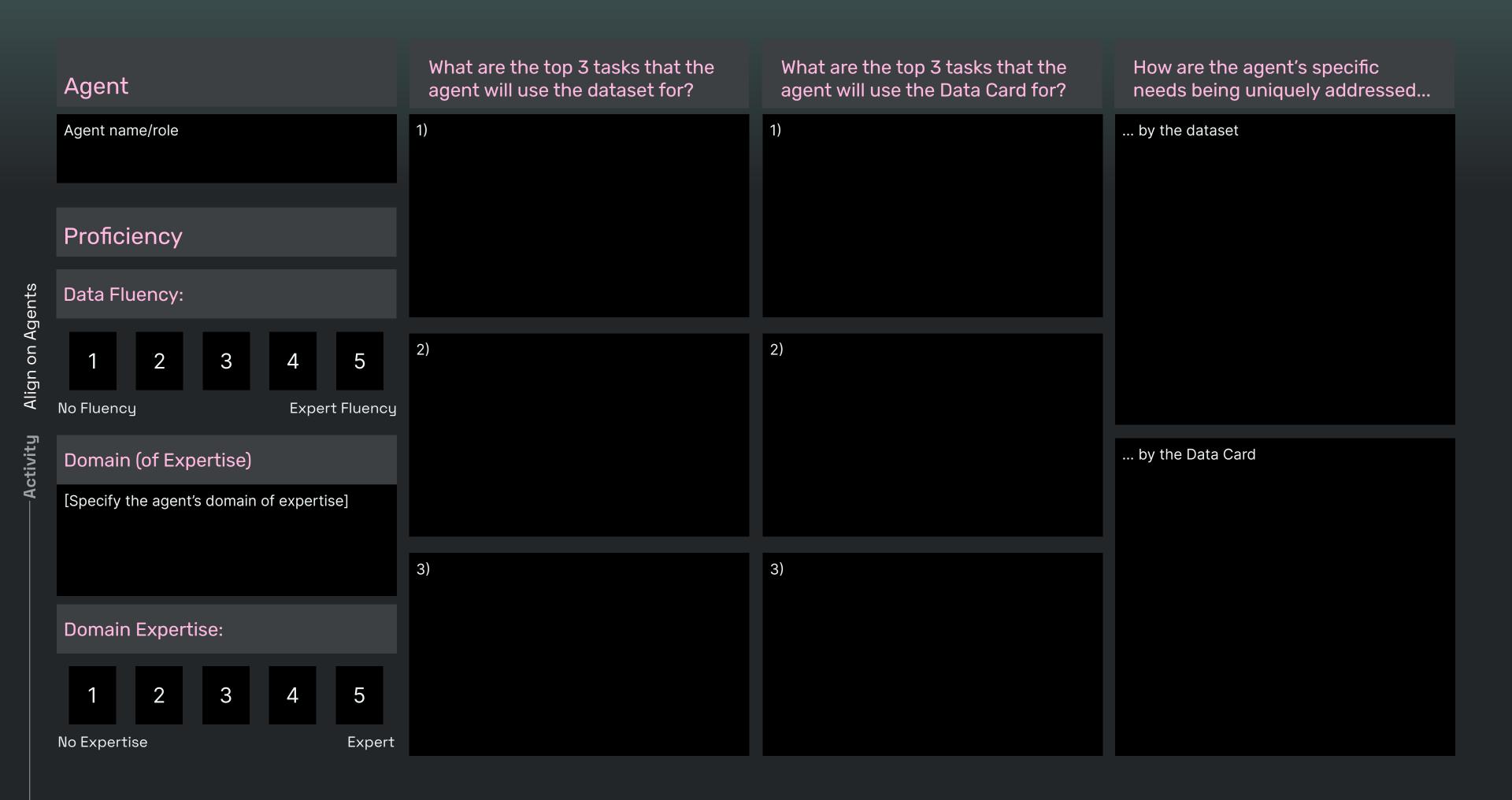
Step 3: Use the prompts to produce your descriptions

Step 4: As a group, review your Persona Worksheets and refine.

Refinements might be merging or splitting agents, filling in the blanks

Step 5: Update the Agents Brainstorm tab in your tracker

These agents represent the audience of your Data Card. Subsequent activities will focus on them.



Pro-tips for Align on Agents Persona Worksheet



Keep it general

Agents represent entire cohorts



Leverage your knowledge

Lean into what you know about agents and experts in the dataset's domain



Think broad and narrow

Consider both extreme and mainstream cases within your personas



Consider levels of expertise

Think about the agent's domain expertise and fluency with data

Next Steps

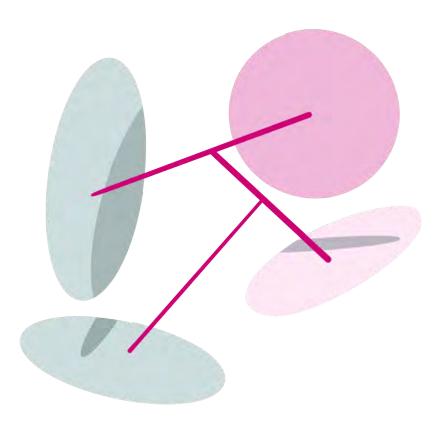
OUTCOMES

Articulated characterics of your audience, and how they might interact with your Data Card and dataset.

FOLLOW UP

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- → Update your Activity Tracker
- → Next: Lens Brainstorm
- → Later: Proficiency Calculator



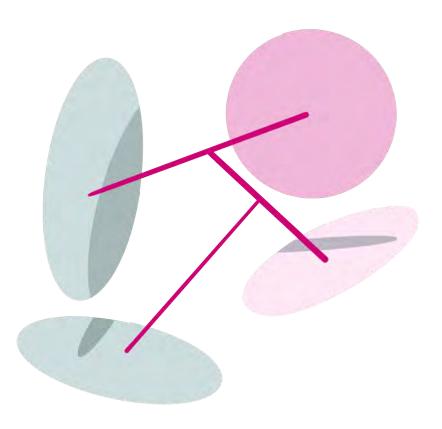
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Lens Brainstorm

Prerequisite checklist

BEFORE YOU BEGIN

- → Read through OFTEn Framework
- → Read through Agent Information Journeys
- → Decide on your agents using Priority Matrix and/or Align on Agents
- → Update results from aforementioned in the Activity Tracker for future reference



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Lens - Origins

As a: <perspective>

Lens - Experience

As a: <perspective>

I want to know

I want to know

ORIGINS: A short, succinct statement that conveys a single idea about the early stages of a dataset's lifecycle when decisions to create a dataset are made.

EXPERIENCE: A short, succinct statement that conveys

a single idea about the use of the dataset in

experimental, production, or research practice.

Lens - Factuals

As a: <perspective>

I want to know

FACTUALS: A short, succinct statement that conveys a single idea about the process of collecting, labeling, rating examples, and corresponding outputs.

Lens - n=1

As a: <perspective>

I want to know

n = 1: A short, succinct statement that conveys a single idea about actual samples of data - in distribution, out-of-distribution, etc.

Lens - Transformations

As a: <perspective>

I want to know

TRANSFORMATIONS: A short, succinct statement that conveys a single idea about processes that make raw data usable, such as filtering, validating, parsing, formatting, and cleaning.

Lens - Origins

As a: ML data scientist

I want to know

If the publishers thought about fairness when deciding to make the dataset.

ORIGINS:A short, succinct statement that conveys a single idea about the early stages of a dataset's lifecycle when decisions to create a dataset are made.

Lens - Factuals

As a: ML data scientist

I want to know

If the dataset is large enough for my specific task.

FACTUALS:A short, succinct statement that conveys a single idea about the process of collecting, labeling, rating examples, and corresponding outputs.

Lens - Transformations

As a: ML data scientist

I want to know
If and how the data was aggregated.

TRANSFORMATIONS: A short, succinct statement that conveys a single idea about processes that make raw data usable, such as filtering, validating, parsing, formatting, and cleaning.

Lens - Experience

As a: ML data scientist

I want to know
If the dataset can be used for ensemble
learning tasks.

EXPERIENCE: A short, succinct statement that conveys a single idea about the use of the dataset in experimental, production, or research practice.

Lens - n=1

As a: ML data scientist

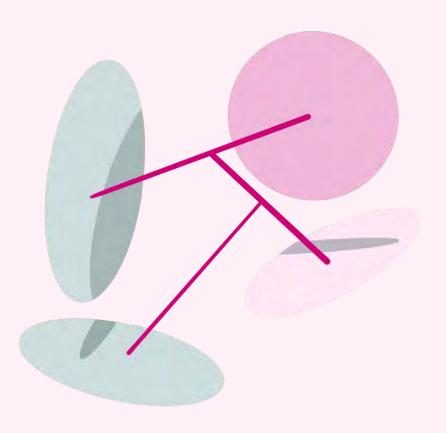
I want to know
What types of examples are
uncharacteristic of this dataset.

n = 1: A short, succinct statement that conveys a single idea about actual samples of data - in distribution, out-of-distribution, etc.

Lens Brainstorm

Create and prioritize Agent Information Journeys for your Data Card that can be tracked over time.

- Create perspective-lens pairs that capture your top agents' information needs
- Brainstorm lenses that are succinct and convey a single idea
- Use OFTEn prompts in Lens Cards to establish well-balanced foundations for your Data Card template



Brainstorm and prioritize lenses for your agents

Step 1: Review your agents

Step 2: Individually, fill out as many Lens Cards as possible for your agents

Step 3: Prioritize your lens cards and share with the group

Step 4: Cluster and vote on your most important lenses

Step 5: Transfer results to the Lens Brainstorm tab in your tracker

These will form the backbone of your Data Card.
Subsequent activities will expand these AIJs to include in your Data Card.

As a(n) [agent], I want to know [origins]	As a(n) [agent], I want to know [factuals]	As a(n) [agent], I want to know [transformations]	As a(n) [agent], I want to know [experience]	As a(n) [agent], I want to know [n=1]

Fill out as many Lens Cards as possible. Go over all OFTEn stages, pushing past the obvious ideas.

A lens is a short succinct statement which conveys a single idea about:

ORIGINS: the early stages of a dataset's lifecycle when decisions to create a dataset are made.

FACTUALS: the process of collecting, labeling, rating examples, and corresponding outputs.

TRANSFORMATIONS: Processes that make raw data usable, such as filtering, validating, parsing, formatting, and cleaning.

EXPERIENCE: The use of the dataset in experimental, production, or research practice

n = 1: Actual samples of data - in distribution, out-of-distribution, etc.

Pro-tips for Lens Brainstorm

Pick one

Pick one OFTEn category, even if they overlap; that's ok

Seep it grounded

Think about agents as groups of people; your lenses are about real people

Strive for high level

A sign of a good lens = can it be converted into a title?

One is wonderful

Each lens should communicate a single idea

Always be refining

Perfect, consolidate, and revise your lenses based on clusters and context

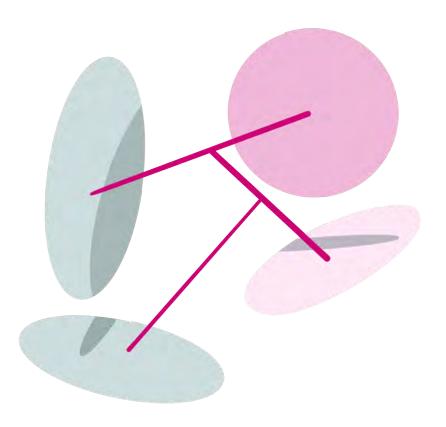
Next steps

OUTCOMES

Define and decide on the most important information journeys of your Data Card or documentation.

FOLLOW UP

- → Update your Activity Tracker
- → Next: Scopes Brainstorm
- → Later: Templatize

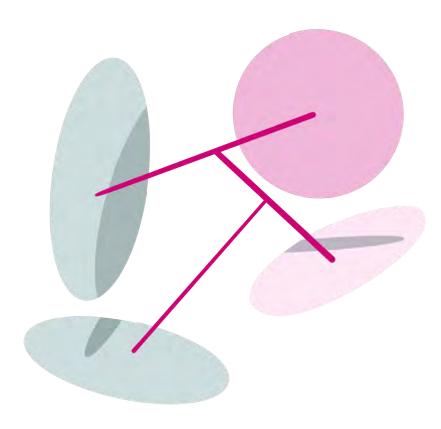


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Prerequisite checklist

BEFORE YOU BEGIN

- → Read through Optics and Scopes Guide
- → Define your agents using Priority Matrix and/or Align on Agents
- → Complete a Lens Brainstorm
- → Update results from aforementioned in the Activity Tracker for future reference



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Lens: Origins

As a: ML data scientist

I want to know:

about any fairness considerations made when designing the dataset.

ORIGINS: A short, succinct statement that conveys a single idea about the early stages of a dataset's lifecycle when decisions to create a dataset are made.

Scopes

I want to know:

about any fairness considerations made when designing the dataset.

So I ask:

Does this data contain protected or sensitive information?

Telescopic Questions: ask about attributes commonly found across multiple datasets.

What types of protected, sensitive, or human information does it contain?

Periscopic Questions: ask about attributes specific to the dataset being created or documented.

Why was this information collected? If any, what steps were taken to protect this information?

Microscopic Questions: ask about unobservable and implicit aspects of the dataset.

Lens: n=1

As a: ML data scientist

I want to know:

about limitations and constraints in the labels of image examples.

n=1: A short, succinct statement that conveys a single idea about actual samples of data - in distribution, out-of-distribution, etc.

Scopes

I want to know:

about limitations and constraints in the labels of image examples.

So I ask:

What type of labeling methods were applied to the dataset?

Telescopic Questions: ask about attributes commonly found across multiple datasets.

Were algorithmic labels generated from the publisher's algorithm?

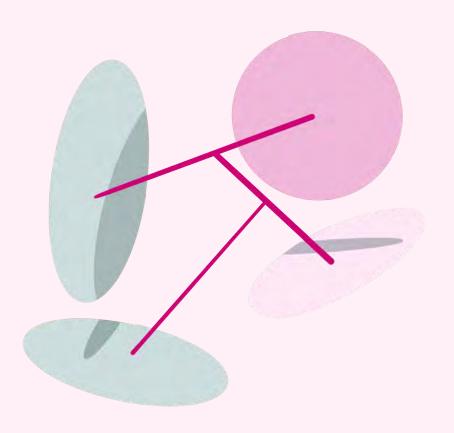
Periscopic Questions: ask about attributes specific to the dataset being created or documented.

How were free-form labels and images obtained? **What types** of constraints were provided? **Who provided** these labels?

Microscopic Questions: ask about unobservable and implicit aspects of the dataset.

Break down lenses into cohesive sets of scopes – concrete questions that you'll answer in your Data Card.

- Unpack each lens into multiple telescopic, periscopic, and microscopic questions
- Scopes offer a concrete path for agents to assess datasets
- Relationships and patterns in scopes create structures to organize information in Data Cards and templates



Break down lenses in the Scopes Brainstorm

Step 1: Review your prioritized lenses

Step 2: Individually or in pairs, fill out as many scope cards as possible for each lens

Step 3: Prioritize your scope cards and share with the group

Step 4: Cluster and vote on your most important scopes

Step 5: Transfer results to the Scopes Brainstorm tab in your tracker

Scopes are the building blocks for your Data Card template.



Fill out scope cards. Refine lenses if needed, but avoid creating new ones.

Scopes are questions that are asked in quick succession to make sense of the world around us.
Scopes can be questions or prompts about:

TELESCOPIC: Attributes commonly found across multiple datasets. When thinking of telescopic scopes, think of questions that elicit indexable "characteristics".

PERISCOPIC: Attributes specific to your dataset. When thinking of periscopic scopes, think of questions that describe "observations" and "evidence".

MICROSCOPIC: Unobservable aspects of the dataset. When thinking of telescopic scopes, think of questions that demand "explanations", or descriptions of rationale and extrinsic considerations.

Pro-tips for the Scopes Brainstorm

- Keep it conversational
 - Don't be overly technical in how you write your scopes
- ? Ask follow-up questions
 - Ask yourself or your teammates questions to dive deeper
- **®** Know that overlaps are still ok
 - Don't worry if there are overlaps in your scopes
- Consider varied perspectives
 - Think about how different agents might frame the same question

Next steps

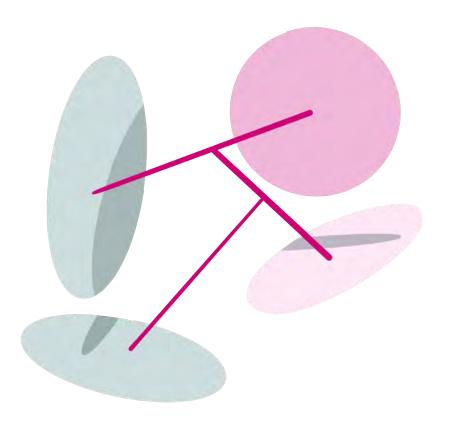
OUTCOMES

Lenses broken down into questions or prompts for your Data Card template.

FOLLOW UP

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- → Update your Activity Tracker
- → Next: Templatize



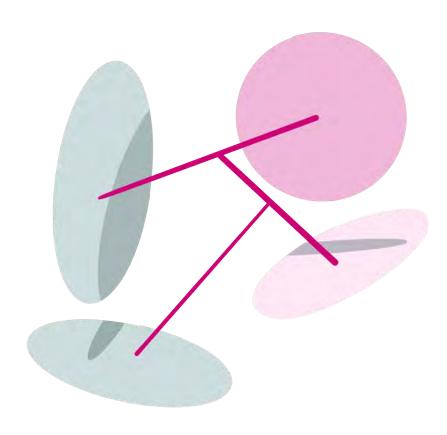
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Templatize

Prerequisite checklist

BEFORE YOU BEGIN

- → Understand the structure of Data Cards
- → Completed Lens and Scopes brainstorm
- → Update results from aforementioned in the Activity Tracker for future reference

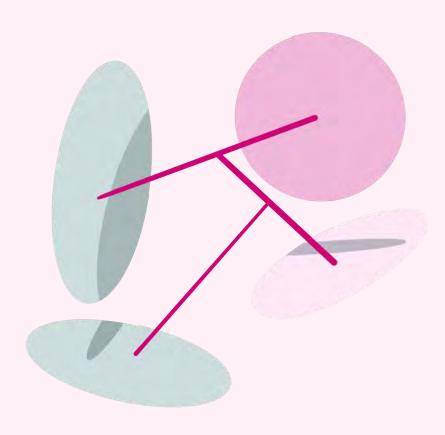


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Data Card Template

Create an intentionally multi-faceted template for your Data Card, which can be critically examined.

- Lenses and scopes should cover almost all of your agents' information needs
- Arrange these into a template based on emergent organization schemes
- Examine this template to find gaps and opportunities



Pro-tips for Data Card Template activity

- Make it snappy
 - Convert a lens into a short title, each denoting one section (or sub-section)
- **Reep it tidy**Organize scopes in rows aligned with each section, for easy reference
- Consolidate where possible

 It's ok to produce sets of scopes which have n telescopic questions, n+ periscopic questions, n++ microscopic questions
- Think outside the box

 Consider how you might update, add, or extend the sections

Use scopes and lens to make a Data Card Template

Step 1: Categorize your scopes and lenses into categories

Suggested: Summary, Access & Licenses, O,F,T,E,n

Step 2: Organize scopes and lenses in sections

Step 3: Turn lenses into titles and scopes into content placeholders

Step 4: Evaluate each section critically, refining your template as you go

Step 5: Transfer results to the Activity Tracker tab in your tracker

Take note of modality-specific lenses. These will become customizable units for your Data Card template.

Write lens here (Title)

telescopic periscopic

Category

microscopic

Organize your lenses & scopes into categories and then create sections.

Use the following prompts to discuss and evaluate each section:

Does this section support the attributes and characteristics described in the Persona Worksheets? Which personas and how?

Is this category too dense or sparse? Is this intentional?

Is there a meaningful hierarchy expressed in the lenses & scopes?

How does this section relate to others? Are there any other sections or sub-sections that are relevant?

Publishers of the dataset

telescopic

What's the name of the institution or organization who published it?

Can publishers be contacted?

periscopic

Which team, group, or group of individuals are responsible for publishing the dataset?

What kind of institution or organization is the publishing party?

Where are publishers located?

How can publishers be contacted for feedback?

Origins

microscopic

Who's (individual) primarily responsible for publishing the dataset?

If the publishers are different from creators of the dataset, who are the creators?

How are creators involved with the dataset if different from publishers?

What is the mission statement of the publishing party?

What should publishers be contacted for? Errata?

EXAMPLE NOTES

Personas:

- Investigative journalist audit
- SW Developer feedback

Is this category too dense or sparse? Is this intentional?

 Too dense, move creators to different

Is there a meaningful hierarchy expressed in the lenses & scopes?

Break up into publishers, funding...

How does this section relate to others? Are there any other sections or sub-sections that are relevant?

 Origins - creators relevant to publishers

Next steps

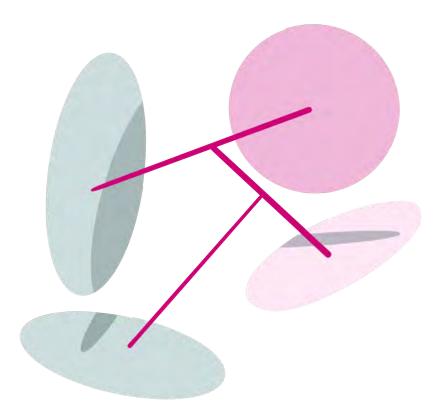
OUTCOMES

Lenses and Scopes organized into a draft Data Card template, ready for critical evaluation in reflective activities.

FOLLOW UP

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- → Update your Activity Tracker
- → Next: Module 02, Inspect



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Dimension Worksheet

Prerequisites checklist

BEFORE YOU BEGIN

- → Read through the Dimensions Guide
- → Update agent proficiency in the Agents Brainstorm tab in the Activity Tracker
- → Have your Data Card or Template ready to inspect



Available vs. required proficiency

- Required data fluency and domain expertise are estimations of how much proficiency is required to successfully make assessments about dimensions
- Available data fluency and domain expertise are estimations of how much proficiency we assume agents possess

DATA FLUENCY

is the familiarity and comfort that agents have with data, either in or outside of their domain of expertise.

DOMAIN EXPERTISE

implies knowledge and understanding of the essential aspects of a specific field of inquiry, in the domain of the dataset.

Dimensions Worksheet

See how your Data Card might help agents come to acceptable conclusions about different aspects of a dataset.

Evaluate your Data Card template with the five Dimensions and identify where and how your Data Card could do better.



Evaluate your Data Card with the Dimensions Worksheet

Step 1: As a group, review the Dimensions definitions

Step 2: Fill out the Dimensions Worksheet, discussing the prompts

Step 3: Take note of action items, improvements strategies, and refinements

Step 4: Transfer your final Dimensions and Proficiency Ratings to the Input Dimensions Worksheet tab in your tracker

These ratings will be carried forward in the Calculators.

No Expertise

* Update in Activity Tracker

Dimension Name: Write the name of the dimension here Overall Dimension Rating* Poor / Borderline / Average/ Solid/ Outstanding **Proficiency Ratings** How much fluency and expertise might be needed to arrive at an informed conclusion about this Dimension from the Data Card? Required Data Fluency* 3 5 No Fluency Expert Fluency Required Domain Expertise 3 5

Domain Expert

Rationale

Write Rationale

Discuss and provide a rationale for how well

this Dimension might be supported and why?

Evidence

Add Evidence

What questions or sections in the Data Card draft support this Dimension and how?

Add Action Items

What steps must be taken to refine the Data Card?

Action Items

1/5: Evaluate your Data Card for Accountability

Overall Dimension Rating* Rationale Evidence **Action Items** Discuss and provide a rationale for how well What questions or sections in the Data Card What steps must be taken to refine the Data this Dimension might be supported and why? draft support this Dimension and how? Card? Poor / Borderline / Average/ Solid/ Outstanding Add Evidence Write Rationale Add Action Items **Proficiency Ratings** How much fluency and expertise might be needed to arrive at an informed conclusion about this Dimension from the Data Card? Required Data Fluency* No Fluency Expert Fluency Required Domain Expertise No Expertise Domain Expert * Update in Activity Tracker

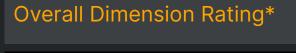
2/5: Evaluate your Data Card for Utility

Rationale Evidence Discuss and provide a rationale for how well What questions or sections in the Data Card this Dimension might be supported and why? draft support this Dimension and how? Add Evidence Write Rationale

Action Items

What steps must be taken to refine the Data Card?

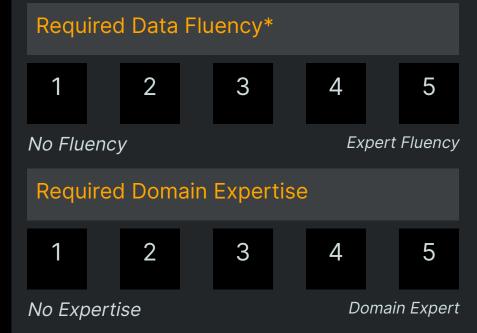
Add Action Items



Poor / Borderline / Average/ Solid/ Outstanding

Proficiency Ratings

How much fluency and expertise might be needed to arrive at an informed conclusion about this Dimension from the Data Card?



* Update in Activity Tracker

3/5: Evaluate your Data Card for Quality

Rationale Overall Dimension Rating* Evidence **Action Items** Discuss and provide a rationale for how well What questions or sections in the Data Card What steps must be taken to refine the Data this Dimension might be supported and why? draft support this Dimension and how? Card? Poor / Borderline / Average/ Solid/ Outstanding Add Evidence Write Rationale Add Action Items **Proficiency Ratings** How much fluency and expertise might be needed to arrive at an informed conclusion about this Dimension from the Data Card? Required Data Fluency* No Fluency Expert Fluency Required Domain Expertise No Expertise Domain Expert

* Update in Activity Tracker

4/5: Evaluate your Data Card for Impact & Consequences

Rationale Overall Dimension Rating* Evidence Action Items Discuss and provide a rationale for how well What questions or sections in the Data Card What steps must be taken to refine the Data this Dimension might be supported and why? draft support this Dimension and how? Card? Poor / Borderline / Average/ Solid/ Outstanding Add Evidence Write Rationale Add Action Items **Proficiency Ratings** How much fluency and expertise might be needed to arrive at an informed conclusion about this Dimension from the Data Card? Required Data Fluency* No Fluency Expert Fluency Required Domain Expertise No Expertise Domain Expert * Update in Activity Tracker

5/5: Evaluate your Data Card for Risk & Recommendations

Overall Dimension Rating* Rationale Evidence Action Items Discuss and provide a rationale for how well What questions or sections in the Data Card What steps must be taken to refine the Data this Dimension might be supported and why? draft support this Dimension and how? Card? Poor / Borderline / Average/ Solid/ Outstanding Add Evidence Write Rationale Add Action Items **Proficiency Ratings** How much fluency and expertise might be needed to arrive at an informed conclusion about this Dimension from the Data Card? Required Data Fluency* No Fluency Expert Fluency Required Domain Expertise No Expertise Domain Expert * Update in Activity Tracker

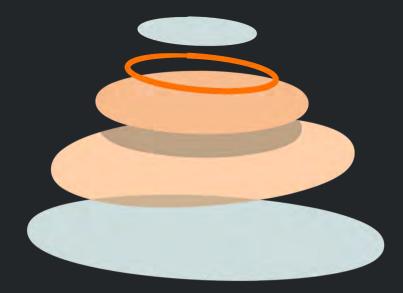
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Pro-tips for Dimensions Worksheet

- **Dimensions are related**
- Overlaps between Dimensions are expected and OK
- ? Duplicated evidence is a strong signal
 A single question used as evidence for multiple Dimensions
- Trust your intuition; you know the dataset

 Take note of sparse evidence or feeble questions
- Mon't go down a rabbit hole

 Keep discussions focused on the Dimensions
- All Dimensions are important
 There's no order of importance



Next Steps

OUTCOMES

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A completed evaluation to identify opportunities for improvements in your documentation or Data Card.

FOLLOW UP

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- → Update your Activity Tracker
- → Fine-tune your Data Card or Template
- → Parking lot: Take note of action items or improvements
- → Next: Fluency Calculator



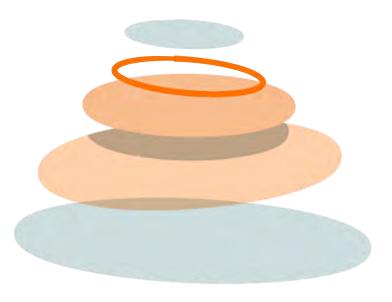
Fluency Calculator

Prerequisites checklist

BEFORE YOU BEGIN

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- → Update agent proficiency in the "Agents Brainstorm" tab of the Activity Tracker
- → Update the required proficiency for dimensions in the "Input: Dimensions Worksheet" tab of the Activity Tracker
- → Have you data card or template ready to inspect



Fluency Calculator

Data Cards should be readable by agents with the lowest fluency in data.

- Flag Dimensions that require a fluency greater than the lowest fluency rating
- Add or remove questions, decide on trade-offs, and discuss how to write answers that agents can easily understand



Follow the steps to use the Fluency Calculator

Step 1: Rank the Dimensions by importance to agents in the Input: Dimensions Ranking (for each Agent) tab in the Activity Tracker

Step 2: As a group, review the Output: Calculators tab in the Activity Tracker

Step 3: Note action items, improvement strategies, and refinements. Track in Dimensions Worksheets.

Step 4: Refine your template and update lenses/scopes in the Activity Tracker

These can be empirically validated once the Data Cards have been filled out.

Making discussions actionable

The colors in the Calculators indicate how easy it might be for agents to read your Data Card.

Use the following prompts to structure discussion, and create a plan to refine your template.

- Which questions will agents find most helpful when making assessments about the dataset for their use cases?
- What information might be missing?
- ► How granular is the information solicited from the questions? Is this sufficient for agents?
- ► What additional resources can we point to?



Accountability

↑ DEFINITELY DIFFICULT



Risk and

Recommendations

↑ LIKELY EASY



Use and Utility

↑ LIKELY EASY



Impact and Consequences

↑ COULD BE DIFFICULT



Quality

↑ DEFINITELY DIFFICULT

	Agent 1	Agent 2	Agent 3	Agent 4	Agent 5
1	Copy–paste dimension from sticker sheet here.				
2					
3					
4					
5					

and paste dimensions in the table.

Decide how important each dimension is to your agents.

 Color the box Red if the required fluency for the dimension is more than the available fluency of the agent. These boxes require special attention.

Use the sticker-sheet below to copy

- Color the box Yellow if the required fluency for the dimension is within the range of the available fluency of the agent. These will require some attention.
- Color the box Green if the required fluency for the dimension is well below the available fluency of the agent.

Do this automatically in the Activity

Output: Fluency Calculators Tab.

QUALITY

ACCOUNTABILITY

RISK & RECOMMENDATIONS

USE & UTILITY

IMPACT & CONSEQUENCES

Tracker. Ensure that your agents' fluency ratings are captured in the Agents Brainstorm tab. Update the Input: Dimensions Ranking (for each agent) tab to see the results in the

Pro-tips for Fluency Calculator

- Help agents make assessments
 - The goal is to have agents plausibly evaluate all Dimensions
- Keep on moving

If you get stuck, move to the next Dimension and come back later

- **Reference personas frequently**
 - The Persona Worksheets cover the benefits, tasks, and uses for each agent
- Sleuth out evidence
 - Look for examples of questions in your template as potential evidence
- Ruthlessly eliminate
 - Use an elimination strategy if you are unable to prioritize

Next Steps

OUTCOMES

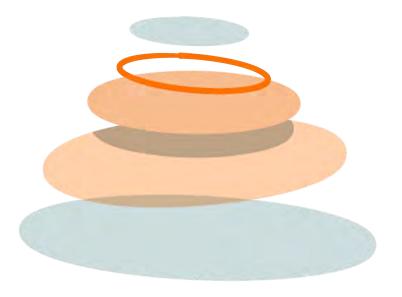
Directional insights and areas for improvement for your Data Card or documentation.

A clear understanding of which agents might find your dataset's documentation challenging to read, and why that might be ok.

FOLLOW UP

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- → Fine-tune your Data Card or Template
- → Parking lot: Take note of action items or improvements
- → Next: OFTEn Calculator



OFTEn Calculator

Prerequisites checklist

BEFORE YOU BEGIN

- → Read through the OFTEn Framework
- → Update your Global Tracker tab in the Activity Tracker with your Data Card prompts and questions
- → Have you Data Card or Template ready to inspect



OFTEn Calculator

Once the Template has been refined for agents, visualize the distribution of your questions using OFTEn

- Assign OFTEn categories by intent: What category should the answer of the question belong to?
- Interpret the results in the context of your dataset as a gut check on benchmarks you would like to hit
- Identify areas where you could add or consolidate questions



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Visualize the OFTEn distribution of your Data Card

Step 1: Update your refined questions in the Global Tracker tab

Step 2: Use the dropdown in the tracker to assign each question an OFTEn category by intent: **What is the intended category that this question should elicit a response for?**

Step 3: Check the distribution of your Data Card in the Output: Calculators Tab. Use the next slide to interpret results

Step 4: As a group, determine the actions needed to update your questions based on your results

The results of this Calculator are purely directional.

No.

Notes on the OFTEn Calculator

The results of the OFTEn Calculator should be interpreted in the context of your dataset.

- A new and unpublished dataset might have a Data
 Card that is heavier for O, F, and T
- ► A dataset with extreme examples could have a considerable amount of detail on "n"
- If this dataset is publicly available with a history of use, the Data Card might emphasize F and E

Aim to arrive at a flat-ish OFTEn distribution.

- If a category is sparse, ask if questions cover sufficient ground and solicit enough granularity in information?
- If a category is very dense, ask if questions are aligned with the Agent Information Journeys, and are helpful for agents?

Next Steps

OUTCOMES

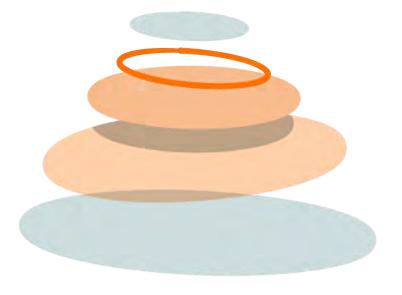
Directional insights and areas for improvement for your Data Card or documentation.

A clear understanding of the robustness and distribution of your Data Card when representing your dataset; and trade-offs where applicable.

FOLLOW UP

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- → Fine-tune your Data Card or Template
- → Parking lot: Take note of action items or improvements
- → Next: 3 Buckets





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