



Instructlab SDG Review Prototype

Instructlab x Graphite Digital

November 2024

About Us



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Graphite Digital

A student organization providing high-quality R&D and tech consulting services for companies.

Previous semester projects include:

- Creating websites for startups
- Designing a data auditing platform from zero-to-one
- Researching and advising on AI model selection and implementation
- Optimizing logistical supply chain data sets
- LLM benchmarking (in progress!)





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Current Problem Space


How do users currently conduct synthetic data review, and how can we help to alleviate any pain points?

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The Problem

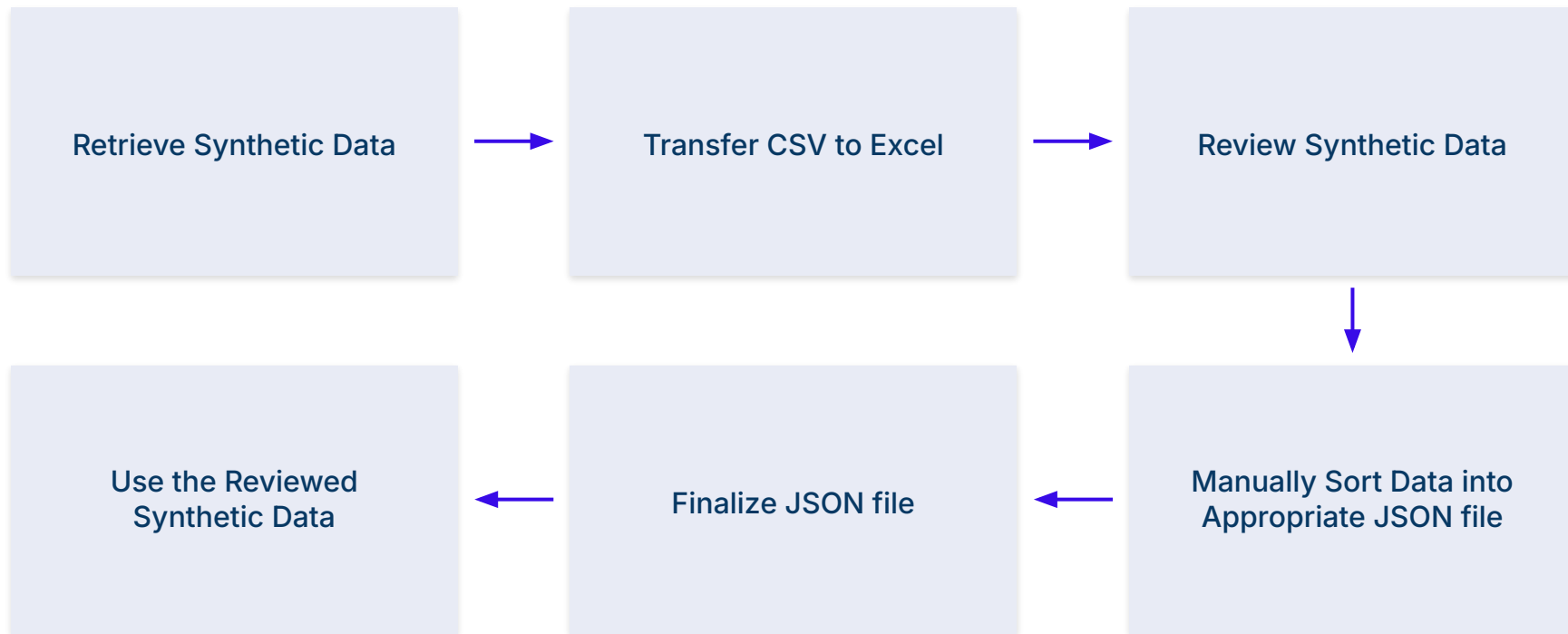
"If I'm **unsure** about the process or answer, I just **hope that someone gets around** to reviewing the question."

– IBM Developer

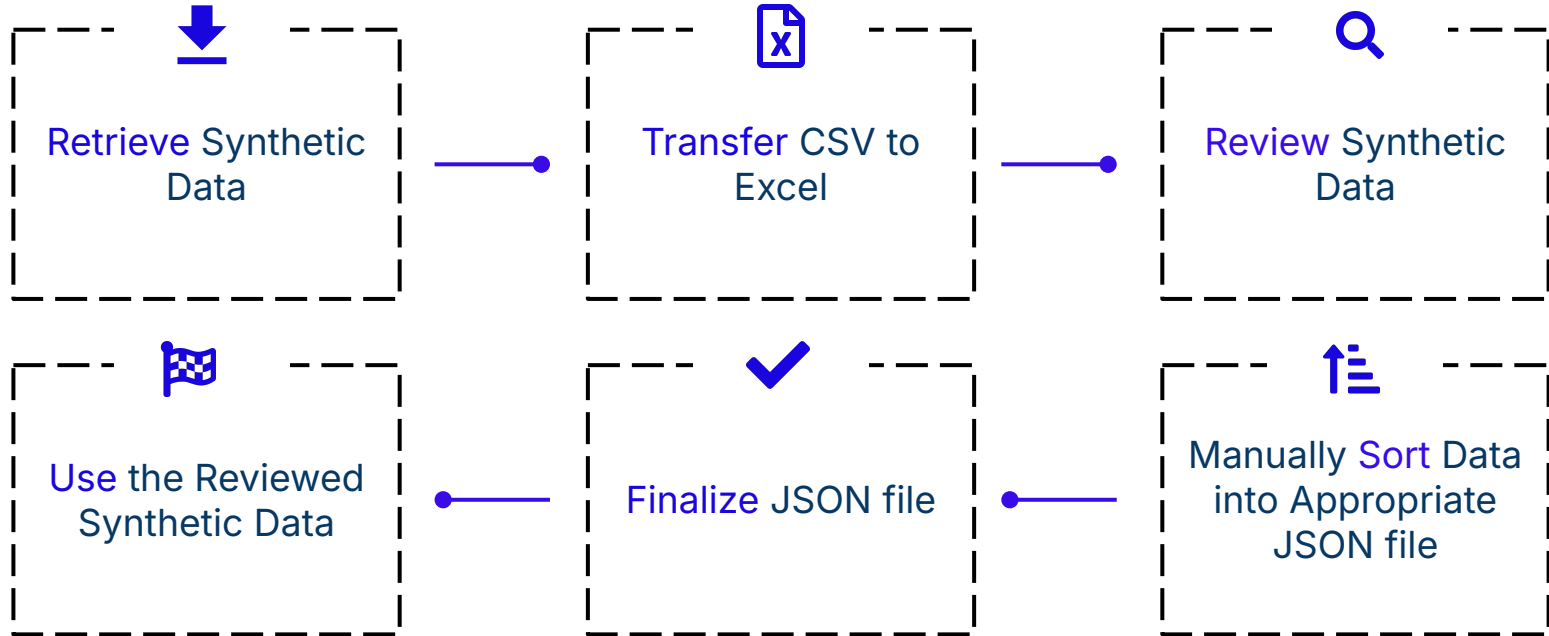


Users currently lack a standardized process or location to review, edit, and approve synthetically generated data.

Example Reviewal Process



Example Reviewal Process



Example Reviewal Process

```
P | ~Documents/WCA/RHELAI_YKT | 330 kB | 127 kB
created_by: IBM
domain: software language
seed_examples:
- question: What does the 'DisplayArea' option of the 'AsaXMsg' macro signify?
  answer: DisplayArea(d) is an option of '?AsaXMsg' macro which indicates the display area towards which the multi-line output is to be targeted. It is assumed that the formatted output *is* multi-line. The display area option input 'd' is a 1-character input, provided to commands in the CMPL. The default is 'Z' which is the 'in-line' area. The caller must be using PL/X to use this option. This is not available on SP5.2.0 or earlier. When connecting (via ConnectID and EndConnect options of 'AsaXMsg'), it is important that the display area be specified on the first WTO (the control line) and that descriptor codes 8 and 9 be specified.
- question: How would I comment out a section of code in PLX without any compiler issues?
  answer: The simplest approach would be to use the PLX Compiler Control statements '@LOGIC;' and '@ENDLOGIC;' around the section of code you do not want to be processed by the compiler. The compiler lists the source records between these markers on the source listing but does not process any of the records in the block in any other way. Using the more common single line comment ('!') and multiline PLX comments ('/* */') are an option as well, but be sure to avoid including semicolons in these comments as they may cause informational messages to be generated by the compiler.
- question: How do I reference a specific element of an array in PLX?
  answer: You refer to an individual element of an array by specifying the array name, followed by a subscript specification that identifies the array element. The subscript specification is a list of values, in parentheses, following the array name. There is an entry in the subscript specification, the subscript list, for each dimension in the array. The element that is referenced is determined by its position in the array, which is determined by subtracting the lower bound for each extent from the corresponding entry in the subscript list and then adding 1 to this value. A simple example would be 'A(4)' which would define the fourth element of an array 'A' that was defined using standard PLX array conventions.
- question: Where is the a PLX reference?
  answer: The PL/Z documentation can be found at the PL/X Knowledge Center site http://plxdocs1.fyre.ibm.com:9090/kc/
- question: What is ZPLX?
  answer: ZPLX is a newer version (version 3) of the PLX compiler. Even if the new version of the compiler is used, only modules that specify ZPLX will get the new behavior, others will fall back to using the prior PL/X version (typically version 2.4.2).
- question: What is the @PROCESS statement?
  answer: The @PROCESS statement provides compiler options.
- question: How do I write a line comment in PL/X?
  answer: A single line comment in PL/X start with the exclamation mark (!). All text after that symbol are treated as comments.
- question: How do I substring?
  answer: In PL/X, you can reference a portion of a string using parentheses and colons. For example if MyStr contains 'ABCDEFGH' then MyStr(4) references the 'E' character because strings, like all PL/X arrays, default to 1 origin. MyStr(2:3) references characters 2 through 3 ('BC') and MyStr(2::3) references three bytes starting at character 2 ('BCD').
- question: How do I catch exceptions in PL/X?
  answer: PL/X does not have exception handling built in so the program must use operating system services for recovery. For z/OS, callers can use ESTAE or SETFRR services (among others) to set up recovery.
task_description: "To teach a language model about editing PLX"
document:
  repo: https://github.ibm.com/spartlow/wca4plx
  commit: a362da8509cfd03a11dc75559146f7b13f4bbe73
  patterns:
    - "markdown/ZH52-1359-03_e1598fd5-5003-459c-898b-d86e0cb9a2de.md"
  ~
  ~
```

Source: IBM

Example Reviewal Process

[illegible]

Example Reviewal Process

Prompt

answerA (ground truth)

answerB

LLMasJ

Integration Into Current Watsonx UI

IBM watsonx Search in your workspaces Upgrade ? IBM account Dallas MB

Projects / InstructLab Project / InstructLab experiment Add knowledge or skills +

Review synthetic data

Review synthetic data quality and cleansing summary. Analyze and regenerate if needed.

Data quality summary

Data cleansed

- 48 instances HAP removed
- 23 instances of PII removed

Preview count: 2 Columns | 100 Rows [Regenerate](#)

Generated Input	Generated Output
Addition (2 + 3)	5
Addition (1 + 2)	3
Addition (2 + 2)	4
Addition (2 + 3)	5
Addition (1 + 2)	3

Current User Pain Points

Unintuitive

- No defined process
- Reliance on knowledge of JSON and CSV formats

Slow

- Manual data management
- Inefficient reviewal process

Uncollaborative

- No integrated mode of collaboration
- Time and expertise wasted



Users need a more practical system for retrieving synthetic data.

What primary functions did we prioritize, and what assumptions did we make?

List and Modular Views



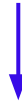
Focused on quick scan and review, with readily available actions in list view.

Collaborative Team Tools (filtering, commenting)



Focused on cross-functional tools to see status of others' review + tag others in process.

Approving, Denying, Editing



Focused on displaying these as main functions.

Solution Considerations

List and Modular Views:

Quick scan and review, with readily available quick-actions in list view.

Collaborative Tooling:

Tools to see status of others' reviews + ability to comment and tag others.

Approving, Denying, Editing:

Displaying these as main functions, with a focus on modular view editing.



Design Walkthrough

Mid-fidelity prototype

3

Review Data

View, approve, deny, edit, and comment on generated data.

To Review (9)

Reviewed (10)



What is the purpose of the program status word's (PSW) program mask in MVS Programming?

The PSW program mask in MVS Programming provides bits to disable program exceptions. When MVS gives control to programs, these bits are usually off, causing many program exceptions.



What are the two MVS services that enable program exceptions and allow a user exit routine to receive control when those exceptions occur?

ESPIE and SPIE services.



How does the SPIE macro enable program exceptions in MVS Programming?

The SPIE macro enables program exceptions by specifying an exception for which the interruption has been disabled.



In which addressing mode does the exit routine receive control for the SPIE macro when an interrupt occurs?

The exit routine receives control in 24-bit addressing mode for the SPIE macro when an interrupt occurs.



What is the difference in addressing mode between the

For the SPIE macro, the exit routine receives control only if the interrupted program is in address address control



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Reviewer

- ☒ Reviewer 1 (self) ☐ Reviewer 4
☐ Reviewer 2 ☐ Reviewer 5
☐ Reviewer 3 ☐ Reviewer 6

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Comments

No comments...

Include any comments here...



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What are program exceptions in MVS Programming and what is their significance?

Program exceptions in MVS Programming refer to specific conditions that cause a program interruption. These can include incorrect parameters, exceptional results, or other issues that disrupt the normal flow of a program ...



What is the purpose of the program status word (PSW) program mask in MVS Programming?

The program status word (PSW) program mask in MVS Programming provides bits to control certain program exceptions. When MVS gives control to programs, these bits are usually off, disabling the program exceptions. By enabling specific bits in the PSW program mask, ...



How do the ESPIE and SPIE services enable program exceptions in MVS Programming?

The ESPIE and SPIE services in MVS Programming enable program exceptions and allow a user exit routine to receive control when those exceptions occur. By issuing the SPIE or ESPIE macro, programmers can specify their own exit routine to be given control ...

What is the difference between the SPIE and ESPIE macros in MVS Programming?

The SPIE macro allows the exit routine to receive control only if the interrupted program is in primary address space control (ASC) mode, while the ESPIE macro allows the exit routine to receive control if the interrupted program is in either primary or access register (AR) ASC mode ...



What is the purpose of the program interruption control area (PICA) in MVS Programming?

The program interruption control area (PICA) in MVS Programming contains the new program mask for the interruption times that can be disabled in the PSW. The



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Comments

What is the purpose of the program status word (PSW) program mask in MVS Programming?

The program status word (PSW) program mask in MVS Programming provides bits to control program exceptions. When MVS gives control to a program, the PSW program mask bits are usually off, disabling the program from receiving exceptions. Programmers can specify their own exit routine to receive control when those exceptions occur.

@Reviewer 2 Does this answer look okay to you?



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Comments

No comments...

Include any comments here...



✓ Approve

— Deny

Reference.pdf

Chapter 7. Program interruption services

Some conditions encountered in a program cause a program interruption. These conditions include incorrect parameters and parameter specifications, as well as exceptional results, and are known generally as program exceptions. The program status word's (PSW) program mask provides bits to control certain program exceptions. When MVS gives control to programs, these bits are usually off, disabling the program exceptions. However, MVS may provide the SPIE and ESPIE services to enable program execution and to allow a user exit routine to receive control when these exceptions occur. This chapter describes the use of SPIE and ESPIE services.

Specifying user exit routines

By issuing the SPIE or ESPIE macro, you can specify your own exit routine to be given control for one or more types of program exceptions. If you issue an ESPIE macro, you can also place the address of a parameter list in the exit routine. When one of the specified program exceptions occurs in a problem state program being executed in the performance of a task, the exit routine receives control in the task of the active task, and in the addressing mode in effect when the SPIE or ESPIE was issued. (If a SPIE macro was issued, this is 24-bit addressing mode).

For other program interruptions, the recovery termination manager (RTM) gains control. The system enables the interruption when the macro is issued.

If a program interruption occurs, the exit routine receives control on interrupt codes 0 through 6. For the SPIE macro, the exit routine receives control only if the interrupted program is primary address space control (PASC) mode. For the ESPIE macro, the exit routine receives control if the interrupted program is in either primary or access register (AR) AR mode. For both the SPIE and ESPIE macros, the exit routine receives control only for interrupts that occur when the primary, base, and secondary address spaces are the same.

The environment established by an ESPIE macro exists for the entire task, until the environment is changed by another SPIE/ESPIE macro, or until the program reaching the ESPIE returns. Each succeeding SPIE or ESPIE macro completely overrides specifications in the previous SPIE or ESPIE macro. You can intersperse SPIE and ESPIE macros in one program. Only one SPIE or ESPIE environment is active at a time. If an exit routine issues an ESPIE macro, the new ESPIE environment does not take effect until the exit routine terminates.

The system automatically deletes the SPIE/ESPIE exit routine when the request block (RB) that established the exit terminates. If a caller attempts to delete a specific SPIE/ESPIE environment established under a previous RB, the caller is identified with a system completion code of 1404. A caller can delete all previous SPIE and ESPIE environments, regardless of the RB under which they were established by specifying a token of zero with the RESET option of the ESPIE macro or an exit address of zero with the SPIE macro.

A program, executing in either 24-bit or 31-bit addressing mode in the performance of a task, can issue the ESPIE macro. If the program is executing in 31-bit addressing mode, you cannot issue the SPIE macro. The SPIE macro is restricted in use to callers executing in 24-bit addressing mode in the performance of a task. The following topics describe how to use the SPIE and ESPIE macros.

Using the SPIE macro

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Approve



Deny

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Using the SPIE macro

Future Iterations

Keyboard Accessibility

Hotkeys were emphasized by users for efficiency.

Customizable keybinds, such as:

- Up, down, left, right
- Delete and return

Could this be a question for accessibility experts?

Manager Dashboard

Users suggested implementing a manager dashboard with a statistical overview:

- # approved
- # denied
- Commenting frequency
- Time per question

Additional Filter

Users expressed interest in the number of approved or denied questions to assess SDG quality.

This could look like:

- Approved (43), Denied (4)

Progress Overview

Completed Steps



Next Steps

Option 1: Project Transfer to IBM

Hand over prototype to IBM to begin development

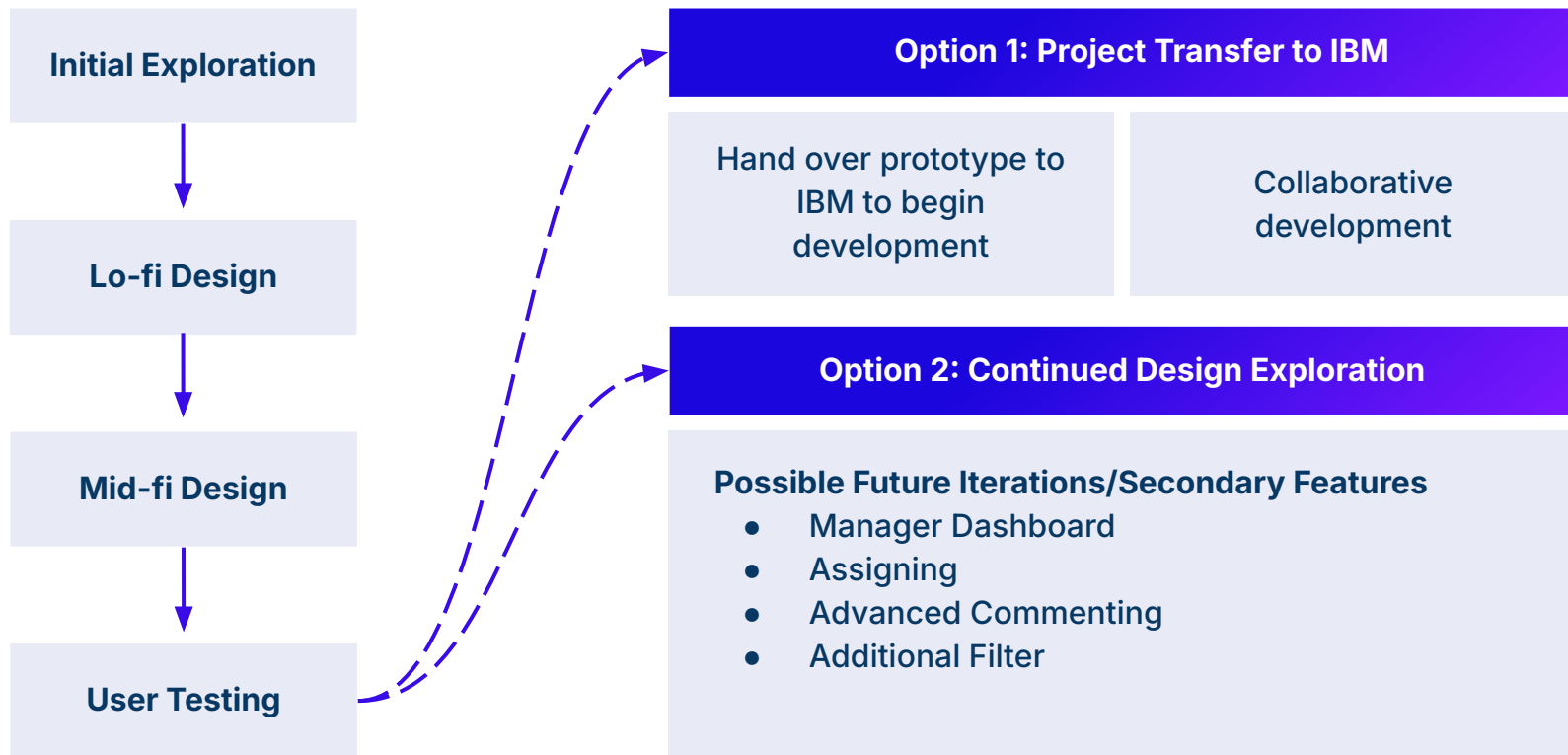
Collaborative development

Option 2: Continued Design Exploration

Possible Future Iterations/Secondary Features:

- Manager Dashboard
- Assigning
- Advanced Commenting
- Additional Filter

Next Steps





*“ This is a big step forwards
from what we’ve been doing
in the past — a large
improvement! ”*

– Jacob Engelbrecht,
Backend IBM SWE



Thank you!

Instructlab x Graphite Digital

November 2024

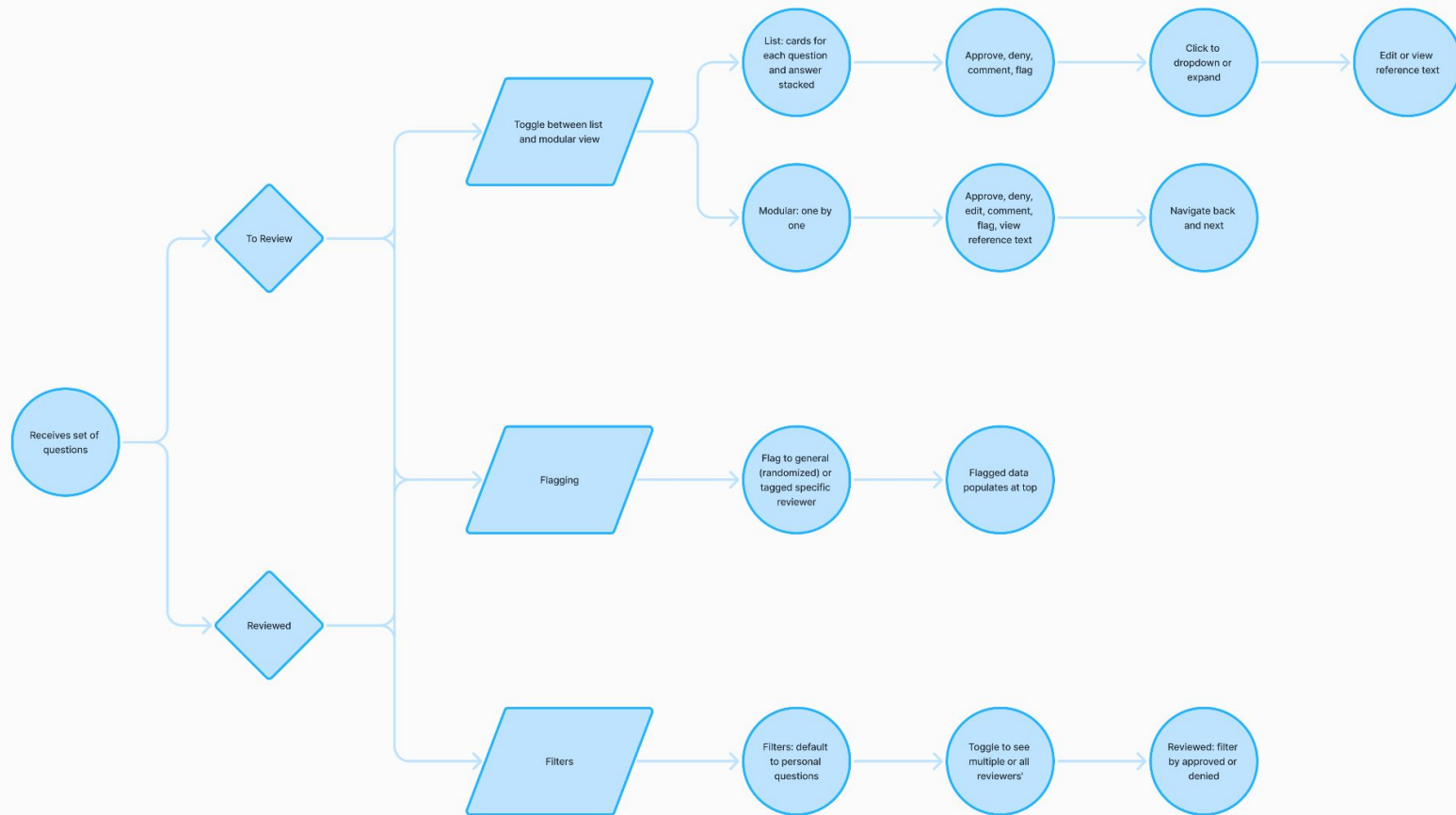
[Figma link](#)

Appendix

Additional Info

Initial Prototype Design

Bringing the first iteration of the tool to life



List View of Data

Filters + dropdown for more filters

question	Answer	✓		
question	Answer	✓	⊙	x
question	Answer	...	✓	⊙ x

Question

Answer

Reference

☐
☐
☐

☐
☐
☐
☐
☐
☐

☒ Emily G. (11/1)

☒ Flagged
 ☒ Unflagged

☒ Approved
 ☐ Denied

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
✓	x	Ⓢ	Ⓢ	Ⓢ

Ⓢ

ref. text

A

☒

☒ Approve
 ☒ Deny
 ☒ Flag

User Research v.1

Testing our first prototype draft with developers

What did our user testing look like?

User Testing Questions

Pre-testing questions:

- Current SDG review
- Anticipated feature uses

Testing questions:

- Users + feature interactions
- Usability of primary features
 - accept/deny, edit, comment, etc.

Post-testing questions:

- Feedback for future iterations
- Secondary functions
 - (assigning, advanced commenting)

Users

User Profile

- Software Developers at IBM
 - One developer was the main lead for project we referenced in the questions
- Time-consuming to edit questions
 - Deeply care
- Future with the product:
 - Ease of use
 - Ability to communicate with others

User-Testing Process

- Each developer → separate breakout room + review process

What were some insights/feedback we drew from user testing?

List and Modular Views

Modular view was used much more than anticipated.

- Focused on one question at a time
- More thorough + slow review process
- Difficult toggling between views

Collaborative Team Tools (filtering, commenting)

The review process was more individual than expected.

- Comment function only used when truly unsure about answer

Approving, Denying, Editing

Users would rather opt for approving, denying, or ignoring rather than editing.

- Could be attributed to the question content
- Emphasis should be more on editing question

Reliance on Reference Document

Strong reliance on reference document during review

- Users struggled to find relevant information in the reference document

Proposed Changes

How can we use the insights gained from testing to improve our prototype?

Immediate Changes

List vs. Modular View

- Users were unsure how to switch back to list from modular view
- Found the icon confusing/not intuitive



- Implemented a toggle button between list & modular views

Commenting

- Users prioritize simplicity
- Comment functions do not need to be overly complex (ex. Forums, etc.)



- Added minimally invasive comment display
- Updated comment icon and notifications

PDF Reference Document

- Users referenced their own resource document for each question, unaware of existing placeholder
- Difficult to find information



- Included reference doc for each question in modular view
- Have a pdf search tool
- Have reference document available in list view

Feedback

Changes

