

2024.10.16 Tampere

Sketchar: Supporting Character Design and Illustration Prototyping Using Generative AI

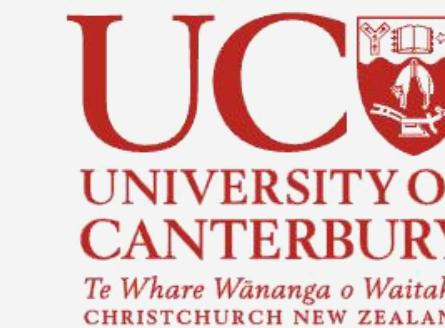
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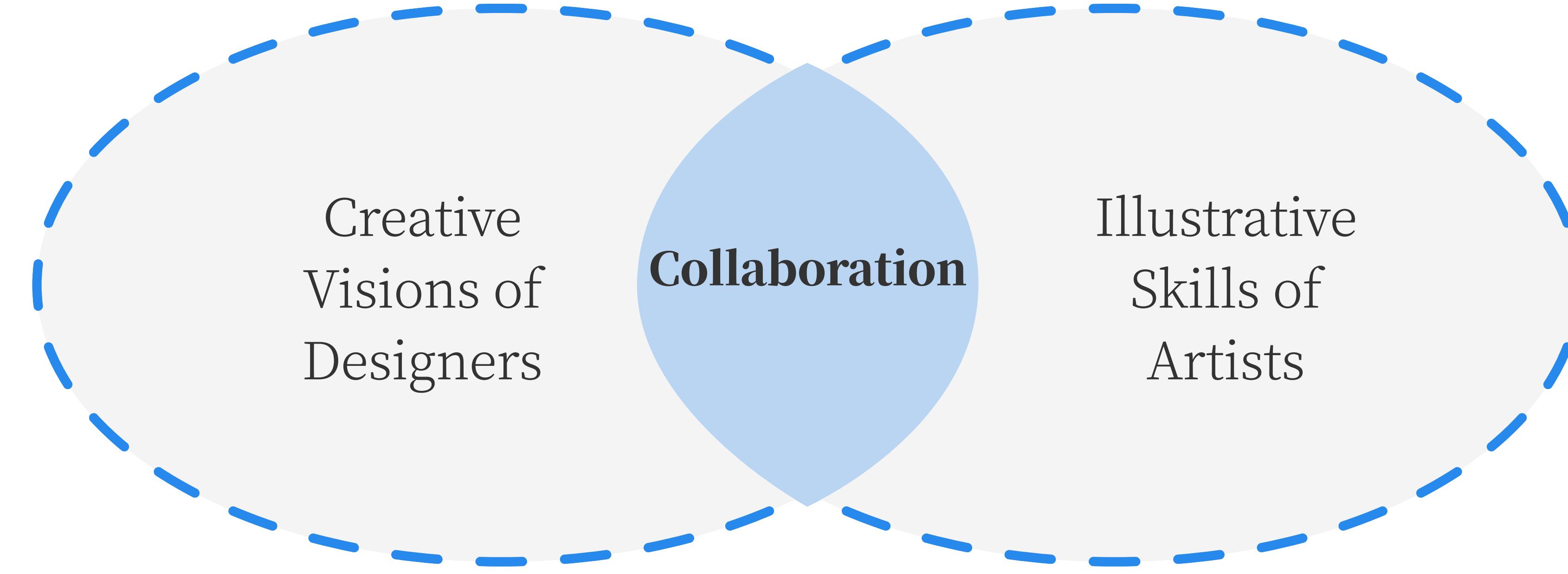
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Background



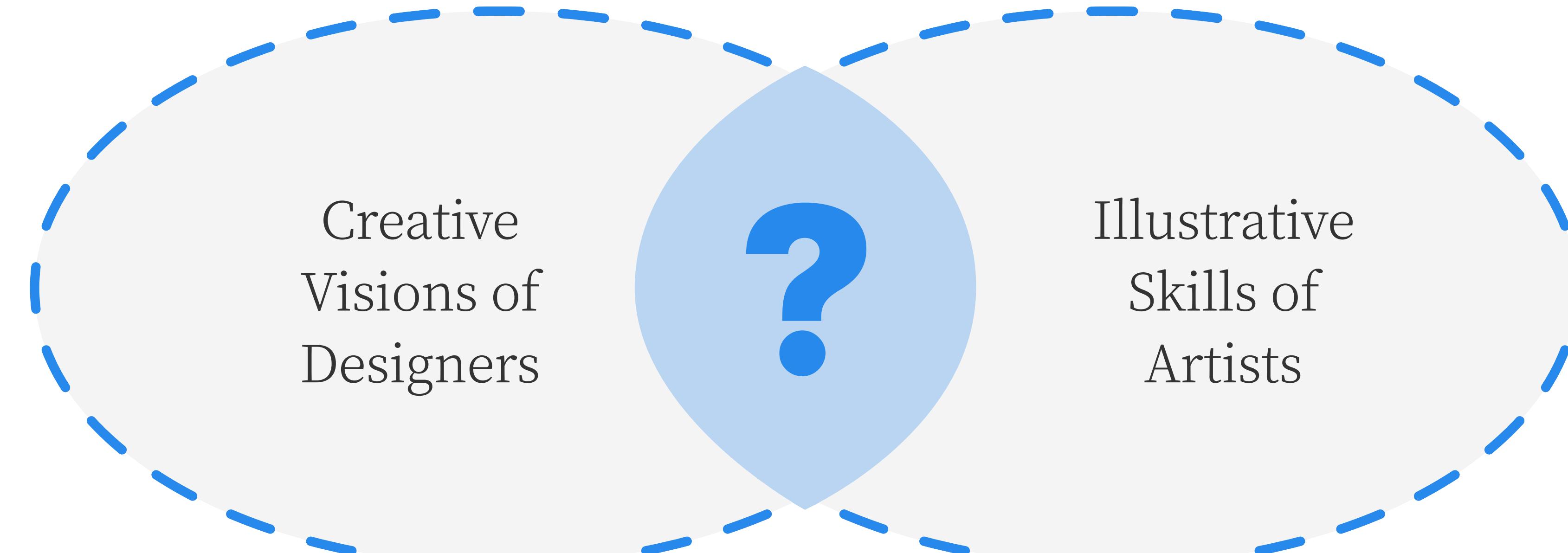
Character design is a key element in game area. The design process includes two stages of character concept development and artwork illustrations. Thus, game character design is a collaboration between the creative visions of designers and the illustrative skills of artists.

However, there are often many obstacles to cooperation between the two groups.

Research Questions

What's the main problems for game designers?

What Challenges



RQ1: What are the challenges to collaboration and communication between designers and illustrators in the team character design process?

Research Questions

What's the main problems for game designers?

What Challenges

Creative
Visions of
Designers

Illustrative
Skills of
Artists

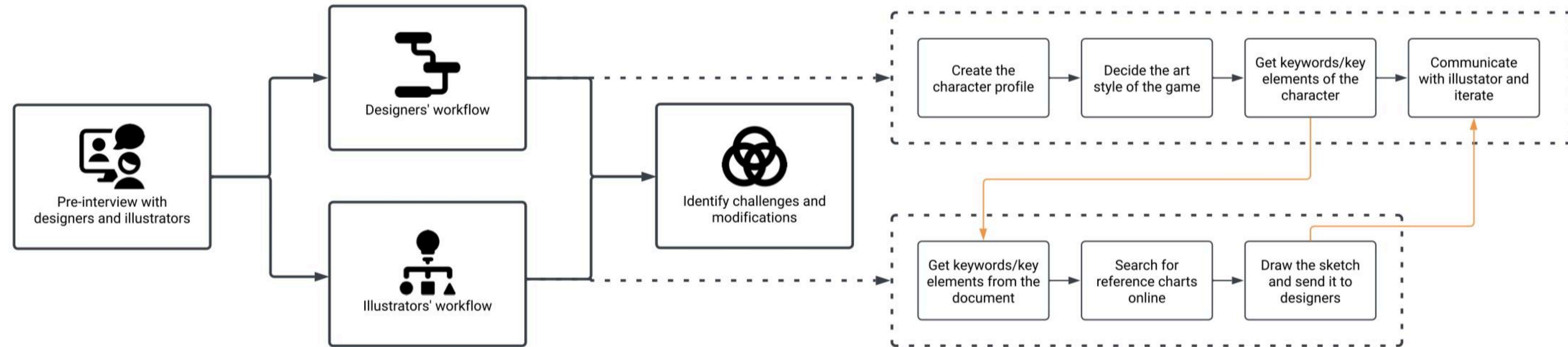
How GenAI Can Support

RQ1: What are the challenges to collaboration and communication between designers and illustrators in the team character design process?

RQ2: How may we facilitate both narrative and artistic aspects of character design in one workflow by applying GenAI tools for both conceptual and illustrative purpose?

Formative Study

Workflow in the traditional game character design process



General Workflow

We conducted formative interviews with 10 professionals. During the interview, we asked about:
(1) their general workflow (2) the challenges in the design process, (3) the way designers and illustrators communicate, and (4) their attitudes towards GenAI tools.

The Problems in Game Character Design

Challenges in the traditional game character design process

7

Communication Gaps

Designers and illustrators face this challenge due to different backgrounds and knowledge.

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Communication Gaps

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Character designers face innovation problems such as inspiration, idea description, and character's reference

Innovation Problems

The Problems in Game Character Design

Challenges in the traditional game character design process

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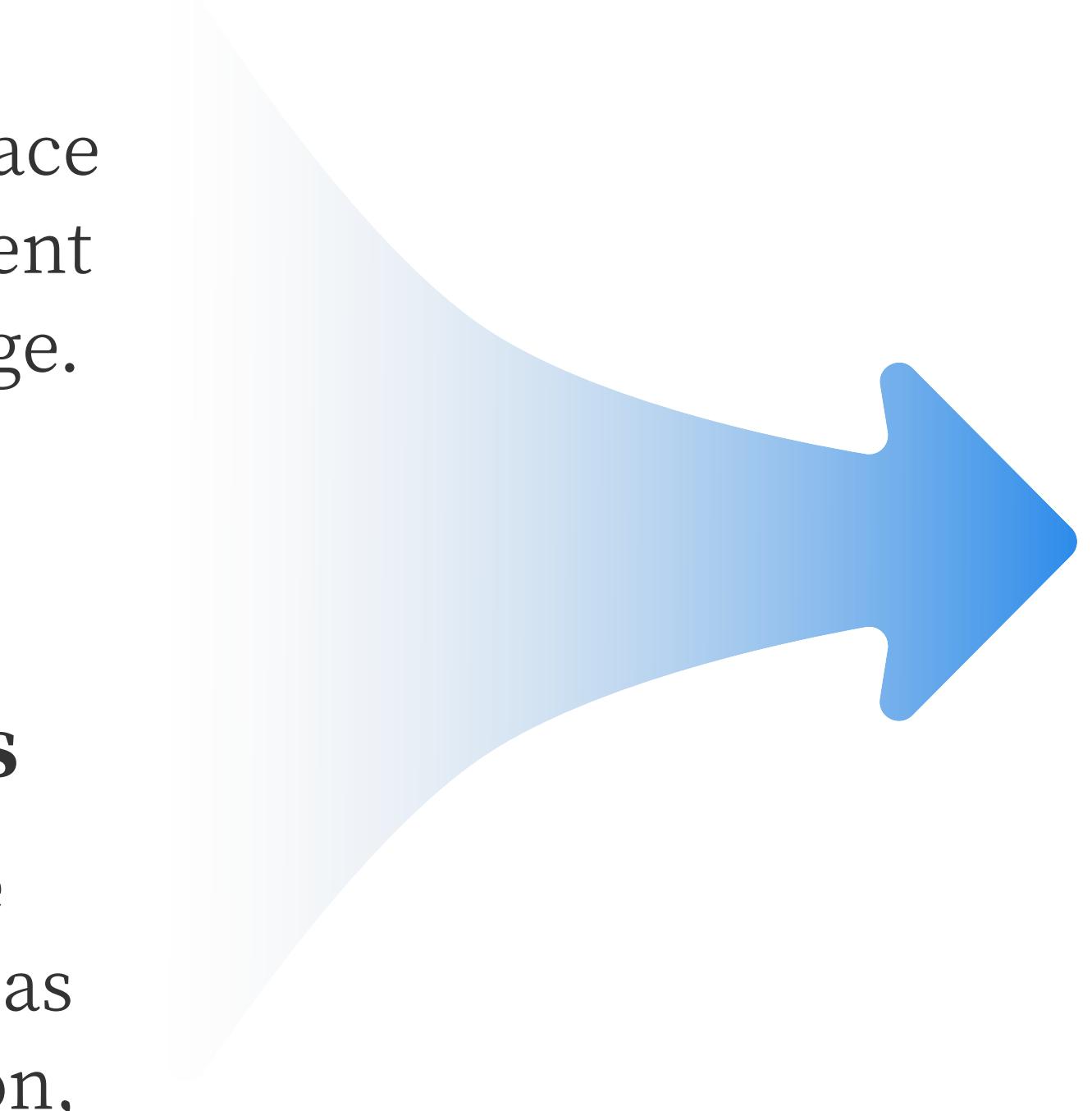
Communication Gaps

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2

Innovation Problems

Character designers face innovation problems such as inspiration, idea description, and character's reference



Suggestions

Keyword refinement based on character design document.

Reference images bridging the communication problem between game designers and artists.

Design Goals

7

Enhancing Keyword-Driven Character Image and Profile Generation

Design Goals

1

Enhancing Keyword-Driven Character Image and Profile Generation

2

Brainstorming Character Properties and Inspiring Creative Ideas by using GenAI.

Design Goals

1

Enhancing Keyword-Driven Character Image and Profile Generation

2

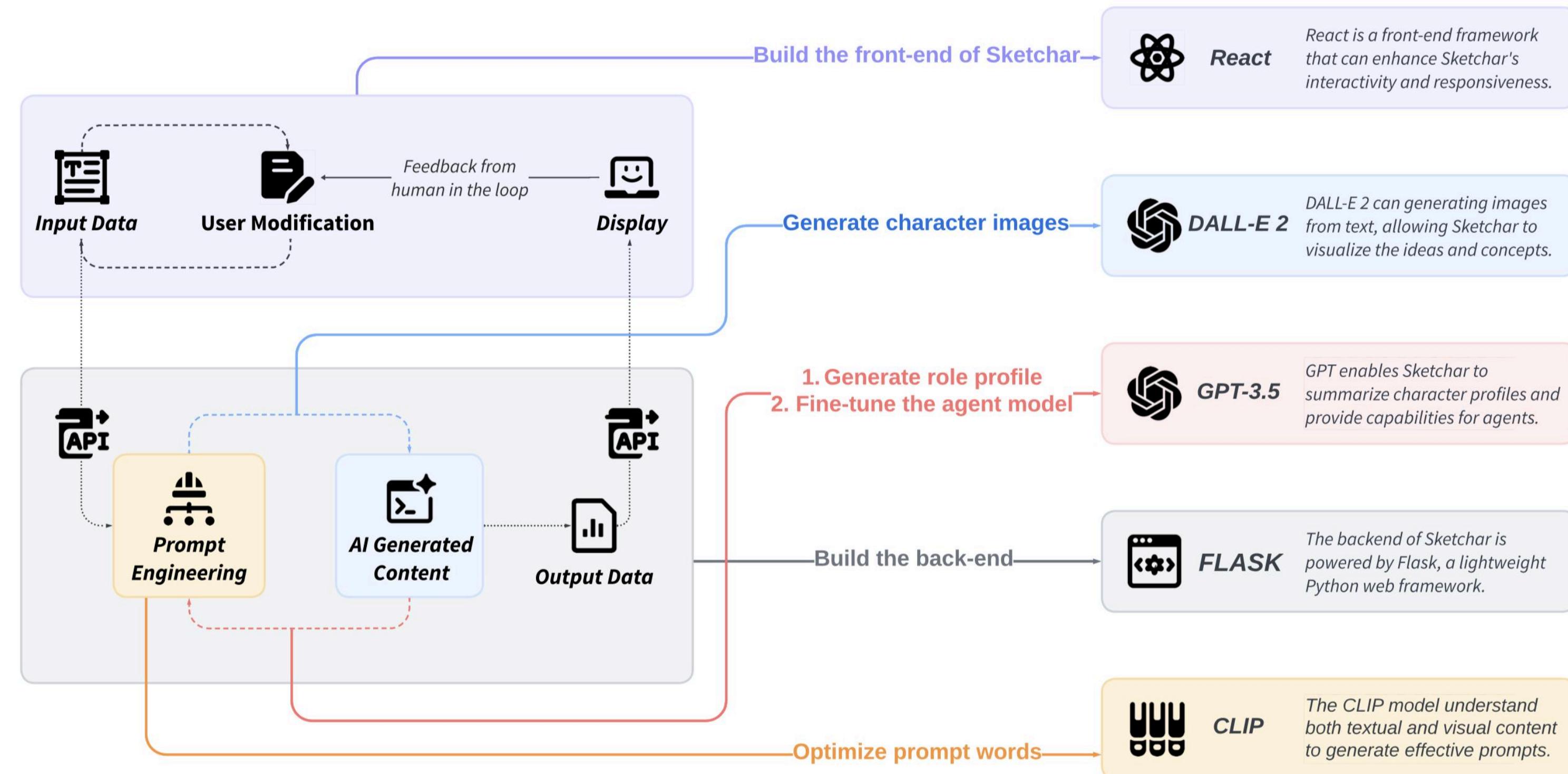
Brainstorming Character Properties and Inspiring Creative Ideas by using GenAI.

3

Constructing Character Sharing Channels as Effective Communication Bridges.

System Architecture

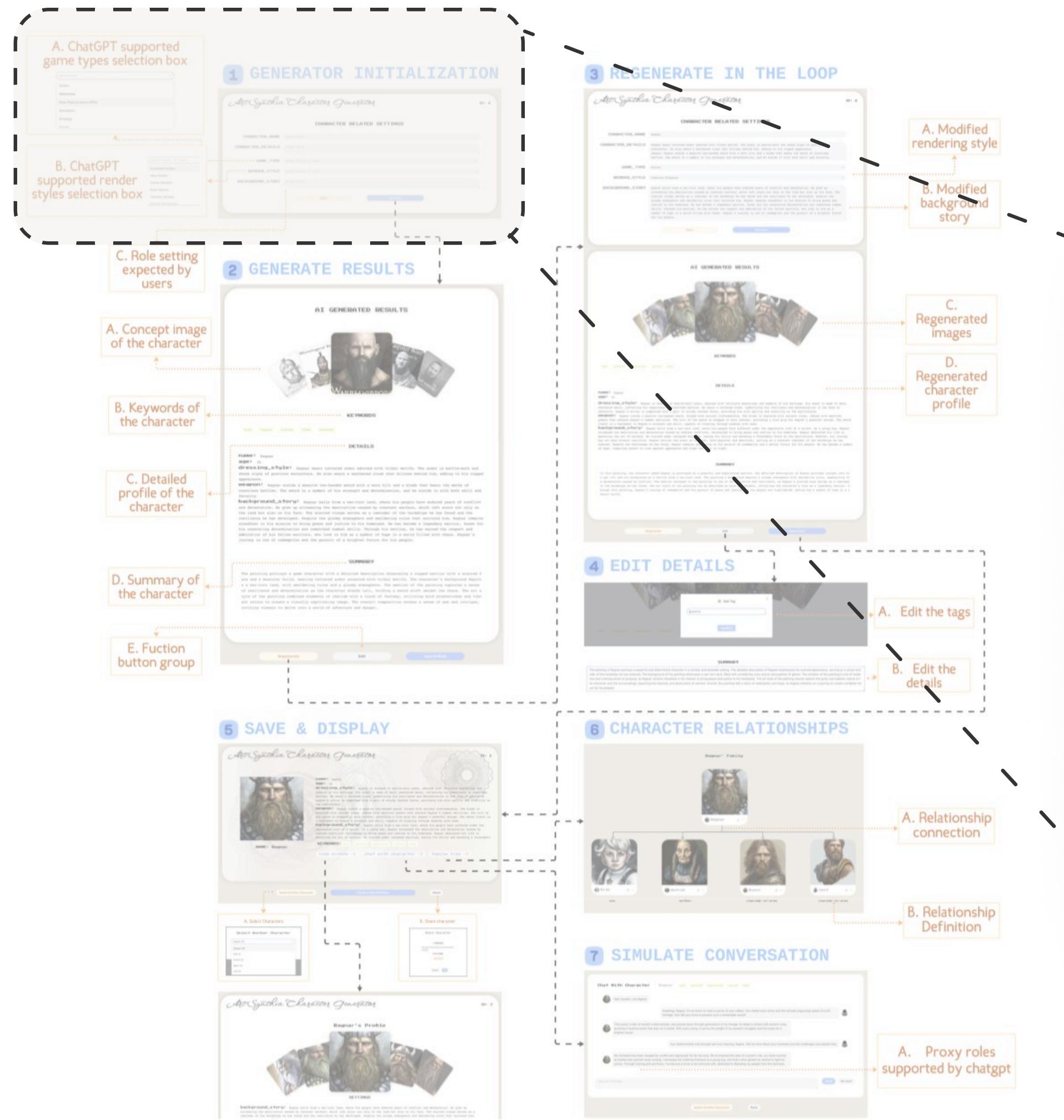
how the system implement



This system is devised to integrate GenAI models(DALLE and GPT-3.5) into a web-based framework with CLIP and prompt engineering. It is frontended by React and the backend utilizing the Flask framework.

Sketchar Walkthrough

Overview of the research project



1 GENERATOR INITIALIZATION

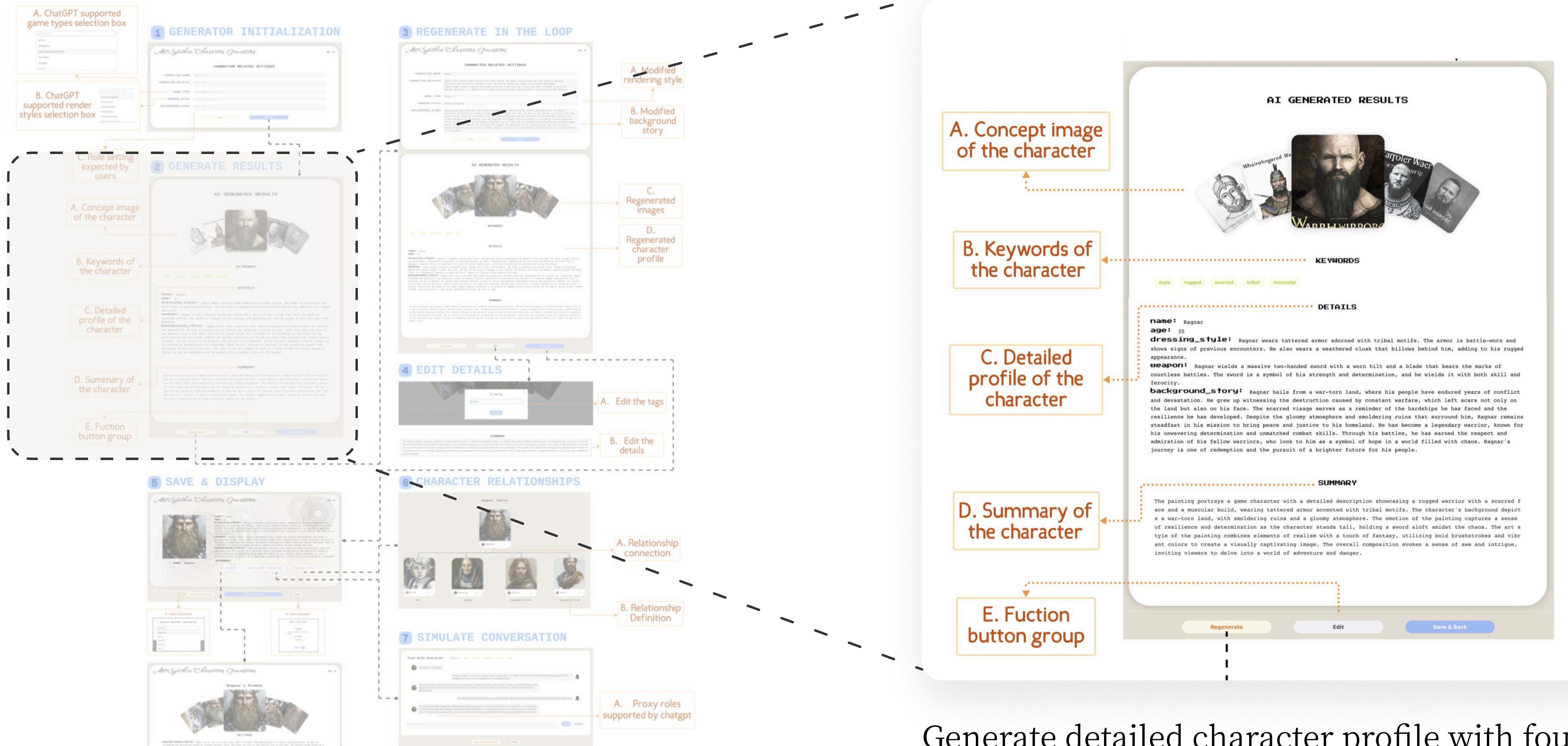


At the beginning, user need to initialize the generator. They should fill in the character name, details, game type, rendering style and background story.

Sketchar Walkthrough

Overview of the research project

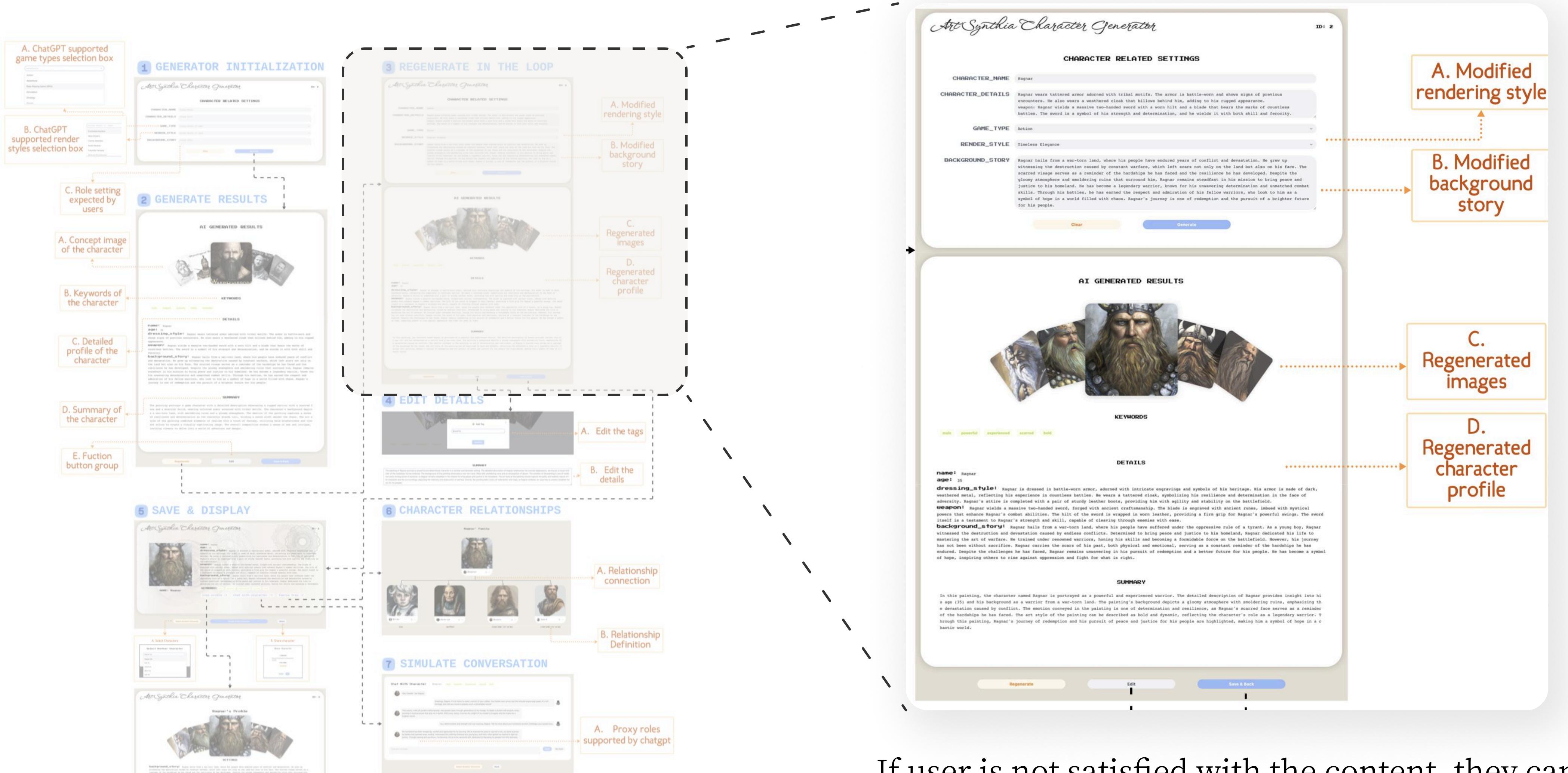
2 GENERATE RESULTS



Generate detailed character profile with four parts: 5 images, keywords, details and summary.

Sketchar Walkthrough

Overview of the research project



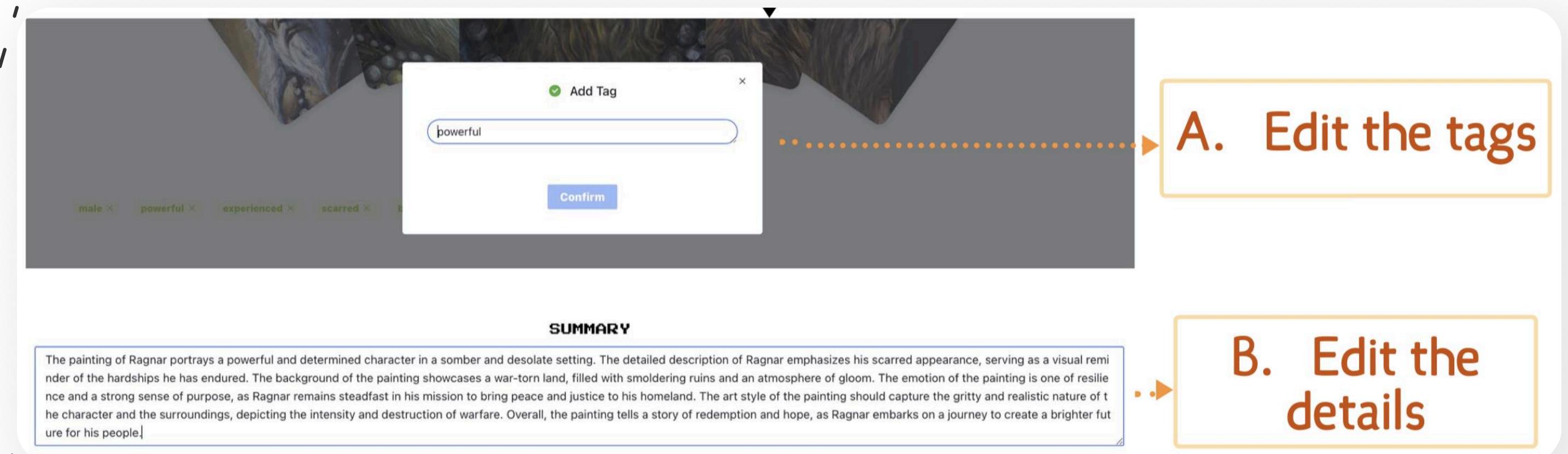
If user is not satisfied with the content, they can regenerate it.

Sketchar Walkthrough

Overview of the research project



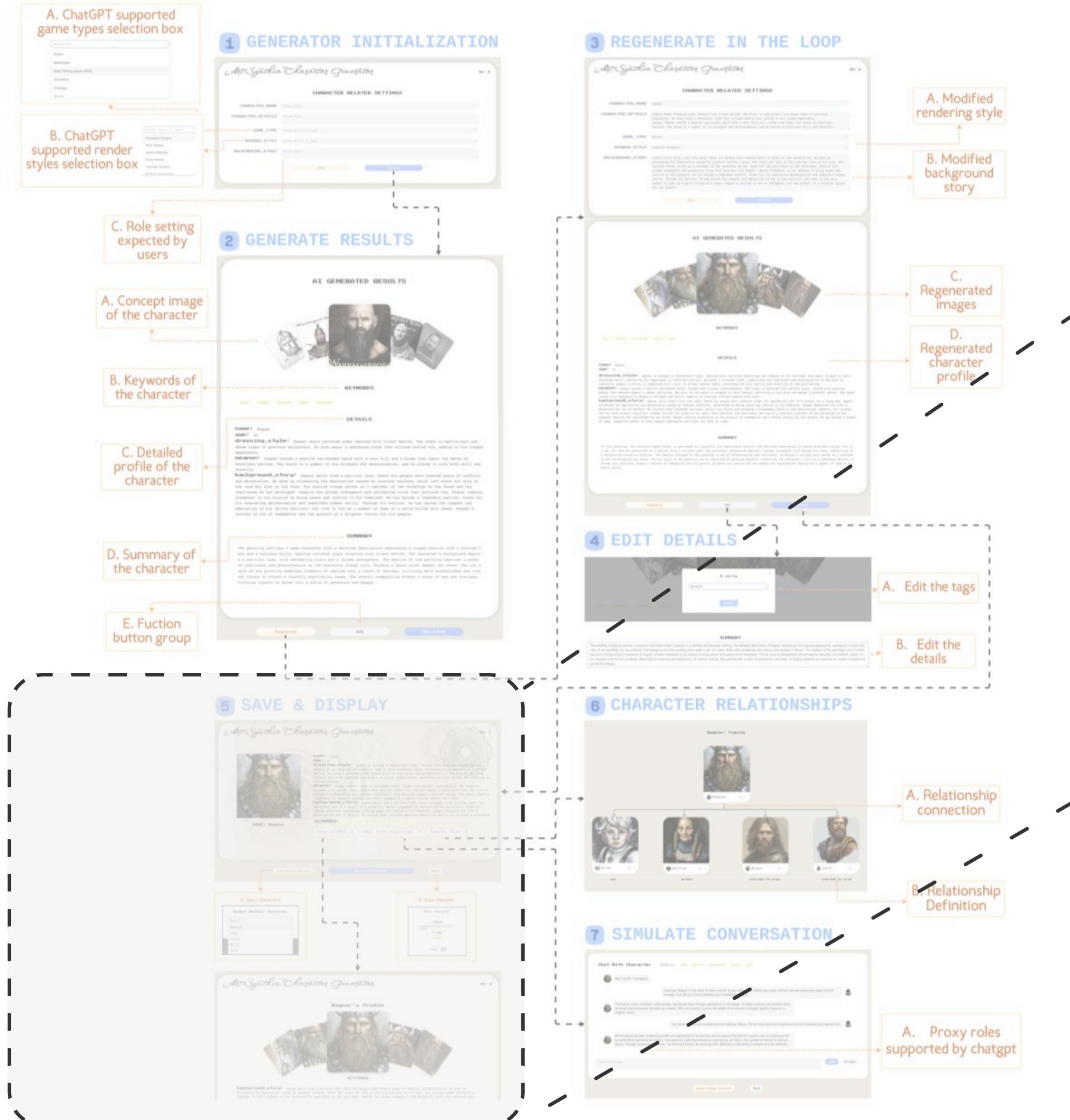
4 EDIT DETAILS



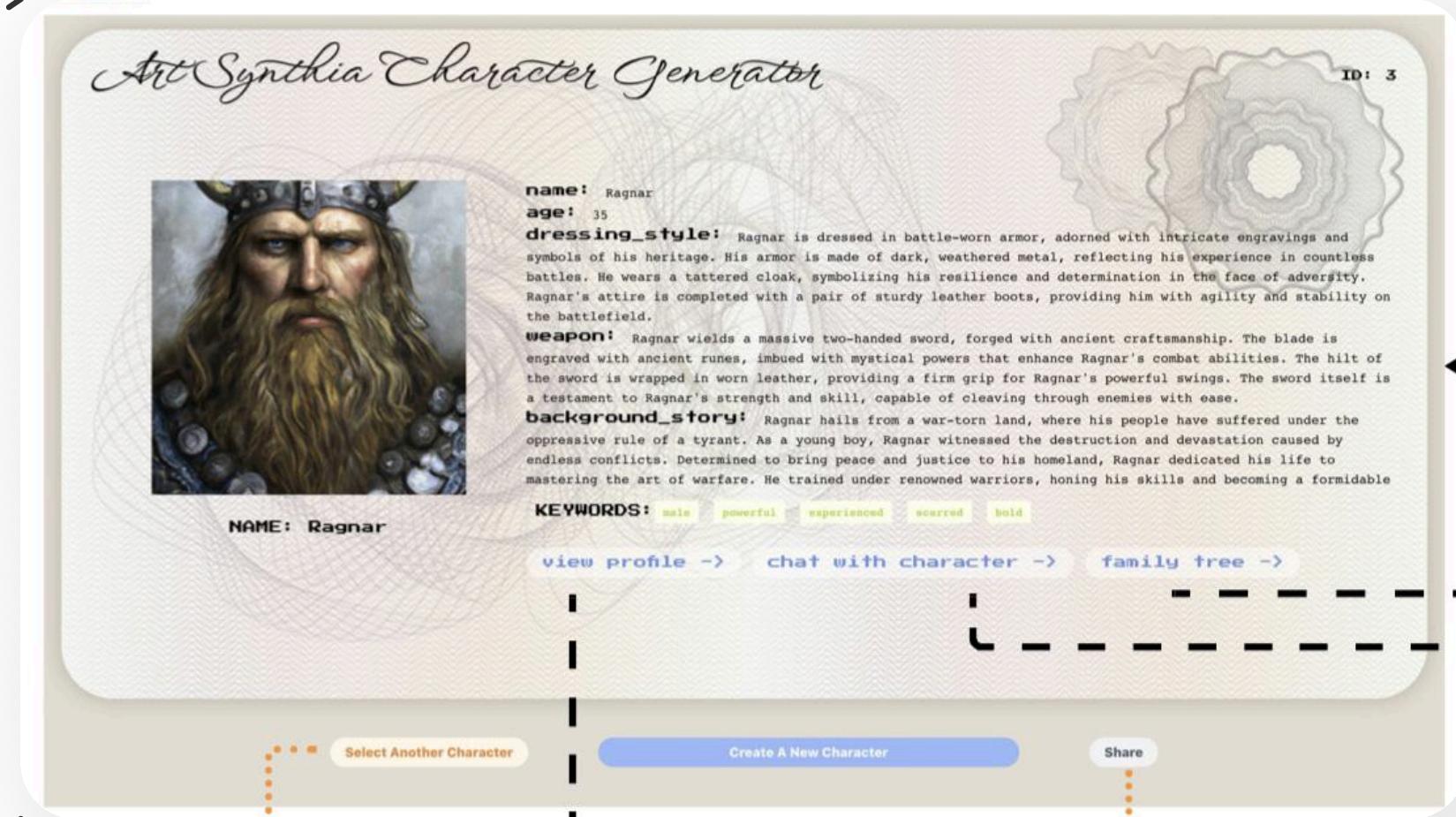
Users can edit every generated content in the character profile.

Sketchar Walkthrough

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5 SAVE & DISPLAY



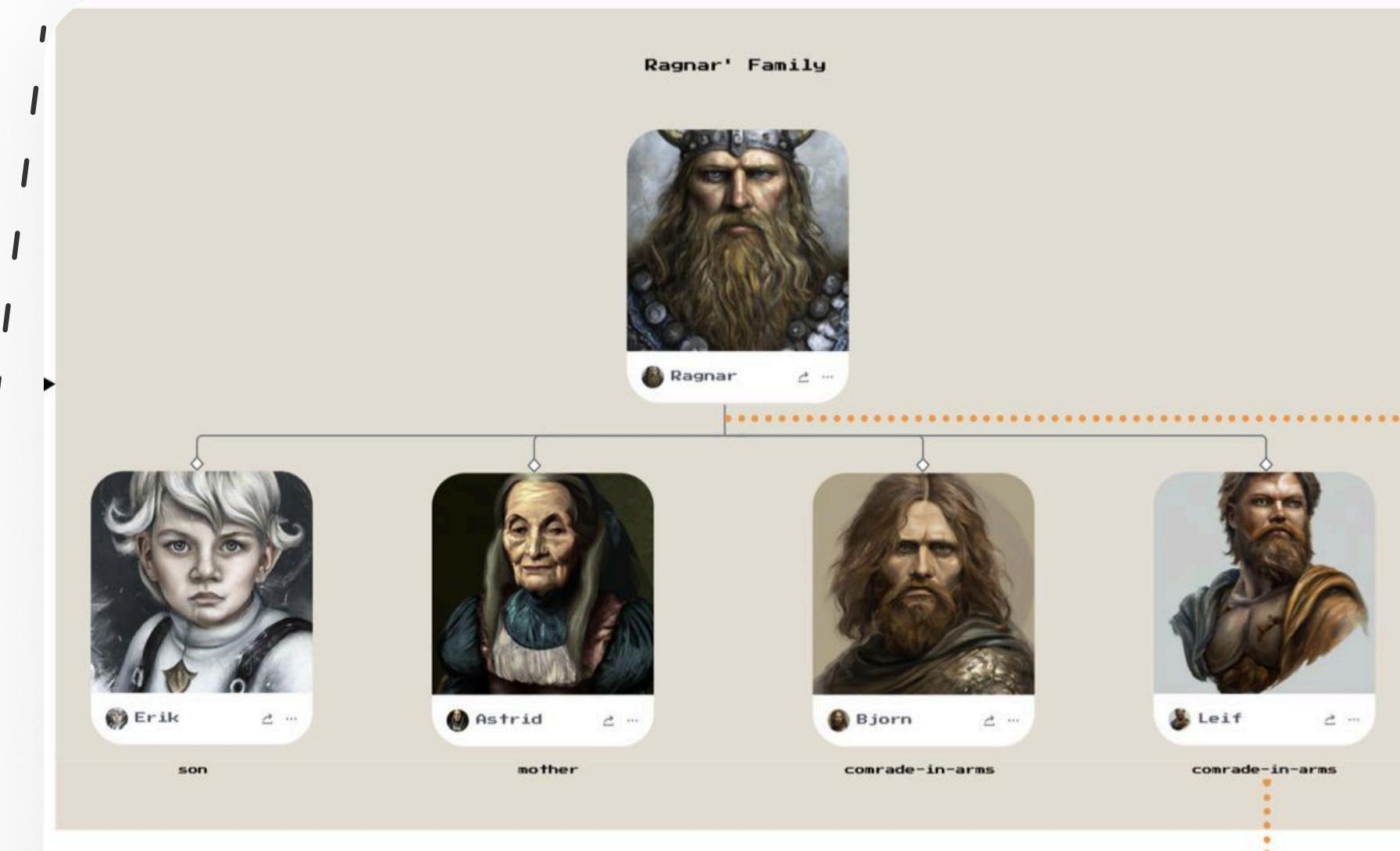
Save the character profiles and it can share with others by linkage or by picture.

Sketchar Walkthrough

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6 CHARACTER RELATIONSHIPS



A. Relationship connection

B. Relationship Definition

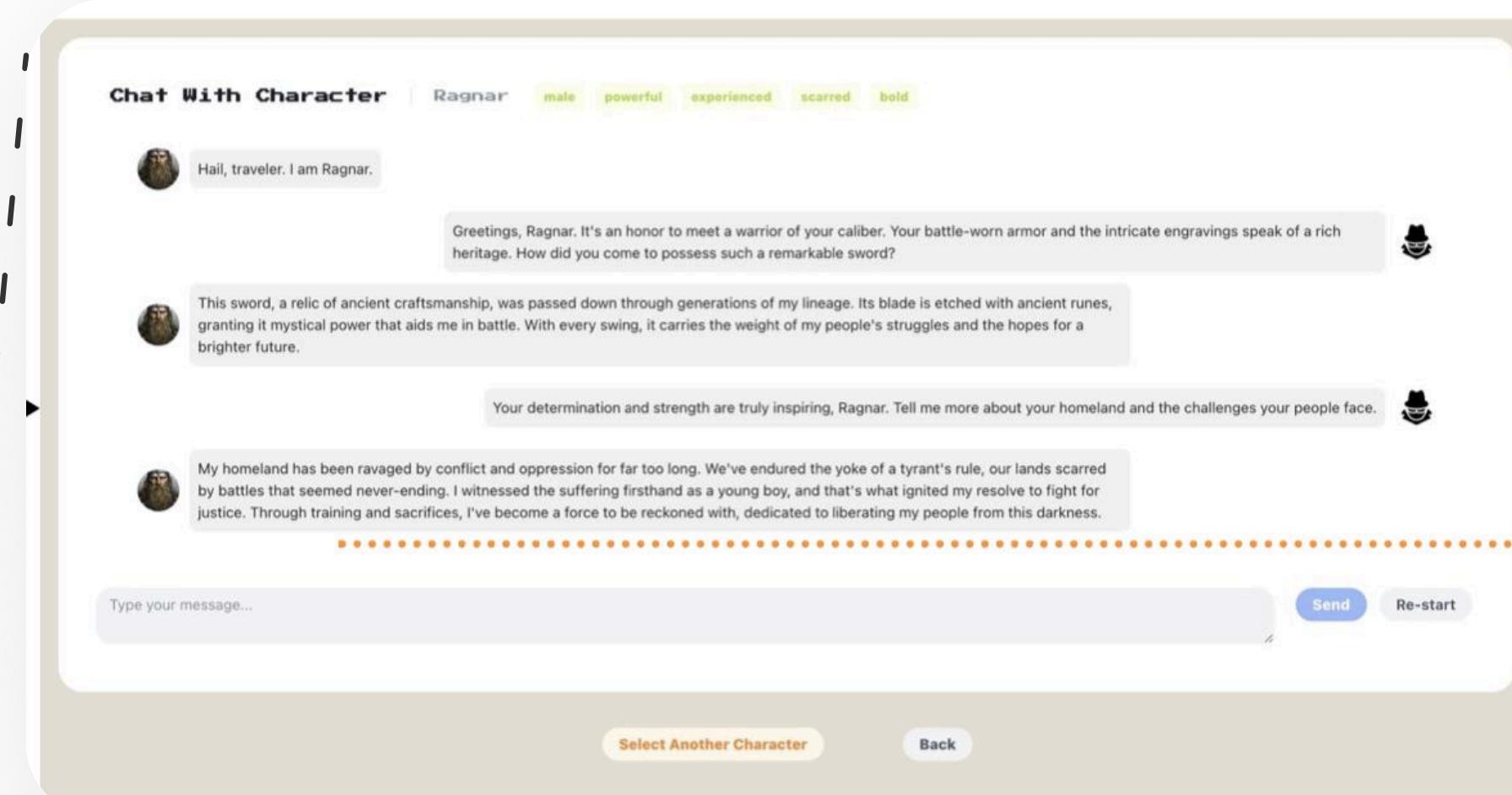
Once finished several characters, user can drag lines to connect them. It can help organize and visualize relationships between multiple characters.

Sketchar Walkthrough

Overview of the research project



7 SIMULATE CONVERSATION

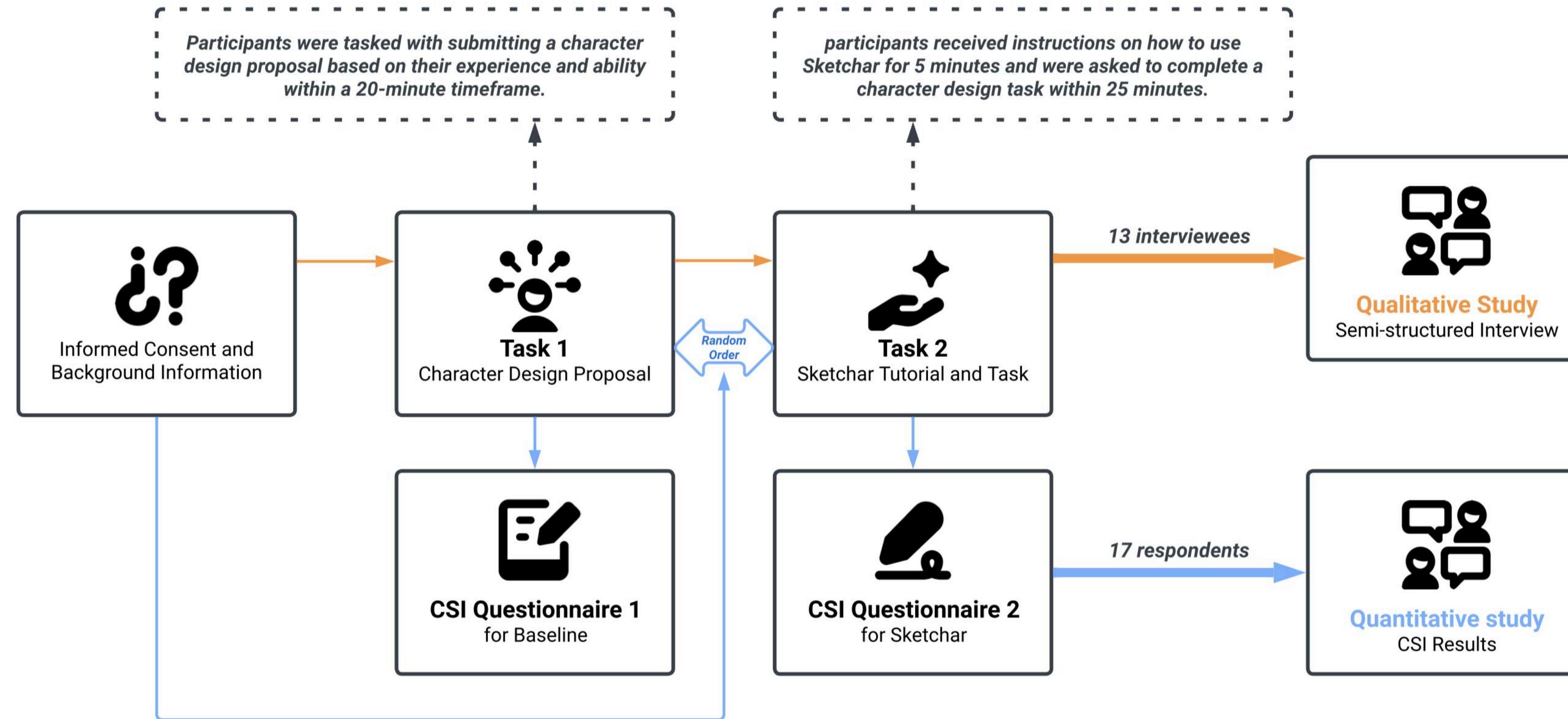


A.
supported by chatgpt

Chat with the character to get more inspiration and offer some help such as create game script. The character's personality, language habits, and background knowledge are provided based on the generated content.

User Study

the experiment design in user study

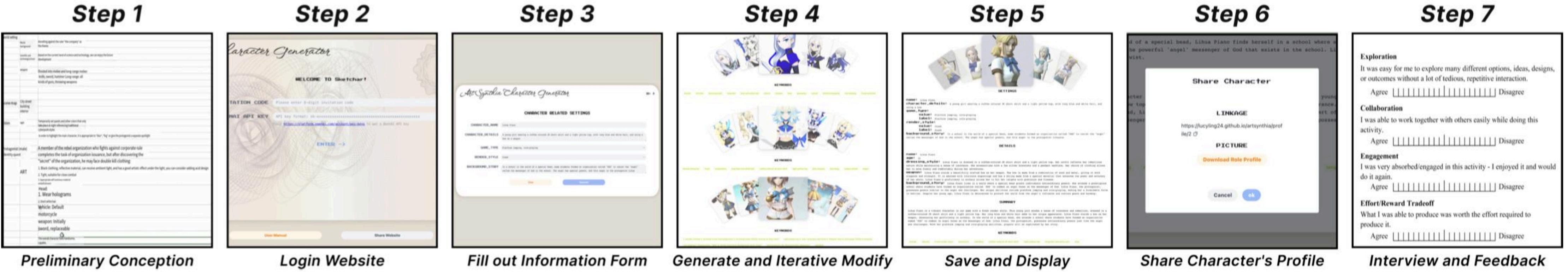


User Study Method and Workflow

We conducted a mixed-method study involving professional game designers. The qualitative study engaged 13 designers who used Sketchchar and provided feedback. Quantitative study with 17 participants revealed that Sketchchar significantly enhanced the Collaboration dimension in the Creativity Support.

User Study

some example of user workflow and outcome



Qualitative Result

Summary of findings from the study

With Artistic Background

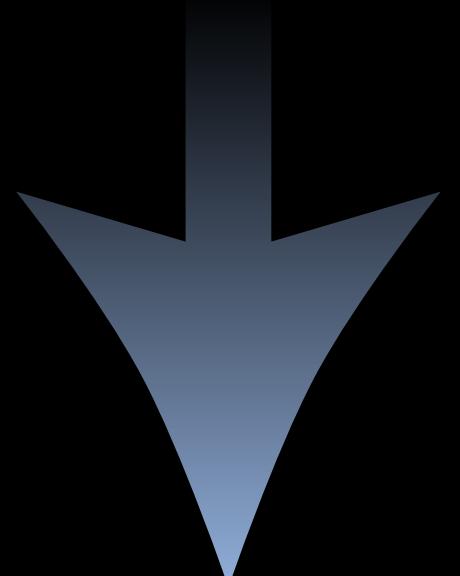
"The generated image is a little bit easy and lacks many details compared with the standard of my workflow."



KF1: Artistic participant backgrounds lead to a higher demand for details of game character design.

"Something is better than nothing."

"Since I don't know how to represent my design in the form of art, I thought generating some simple reference images would help me communicate my design"



Without Background

Qualitative Result

Summary of findings from the study

KF2: Classifying and expanding character design concepts through GenAI assists game designers in expressing creative ideas, fostering refinement of design details.

"The generated documents can serve as the basis for my further detailed design."

"It can help with basic character analysis and style generation. The text sorting and classification aspect is commendable and highly effective, particularly in swiftly organizing appearance, weaponry, and personality details"

Quickly make progress

"The expanded generation of the character's worldview by this tool can also inspire me to think about the whole character's setting."

Beneficial for future work

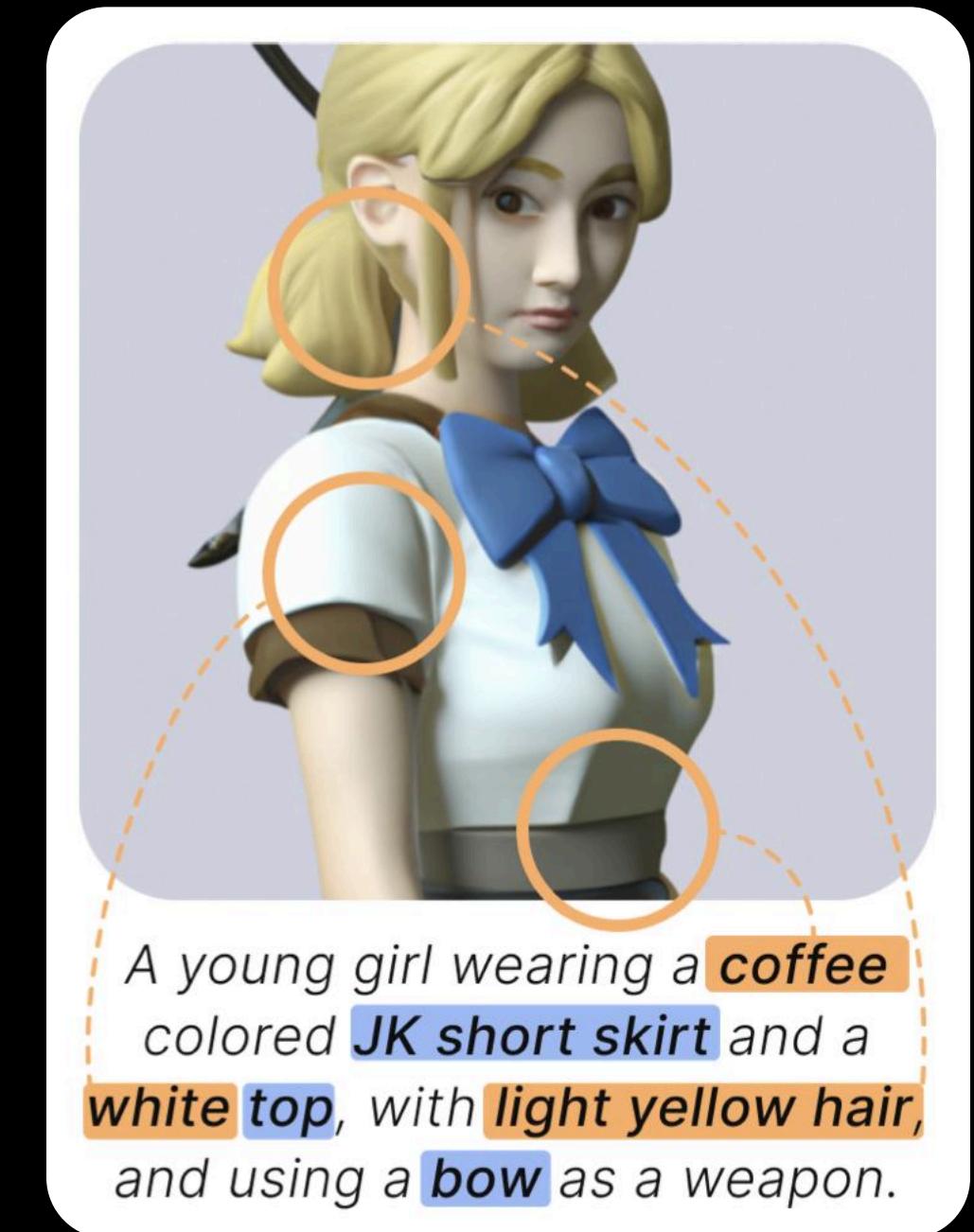
Qualitative Result

Summary of findings from the study

KF3: The generated reference images provided assistance in visually expressing design requirements.

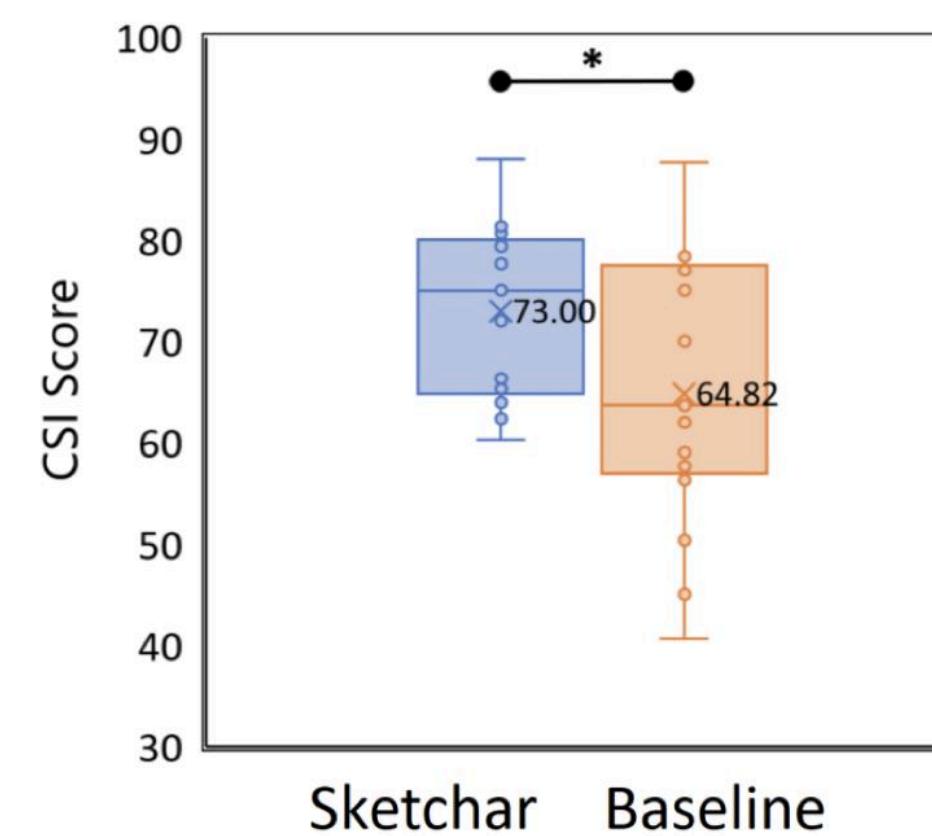
"Merely searching for reference images cannot resolve these matters as many desired characters may not currently exist."

"I can inform the illustrator that I desire the face and hairstyle depicted in this picture while requesting adjustments regarding hair and clothing coloration. In this manner, the communication document commences with a visual representation to convey my preferences and concerns."

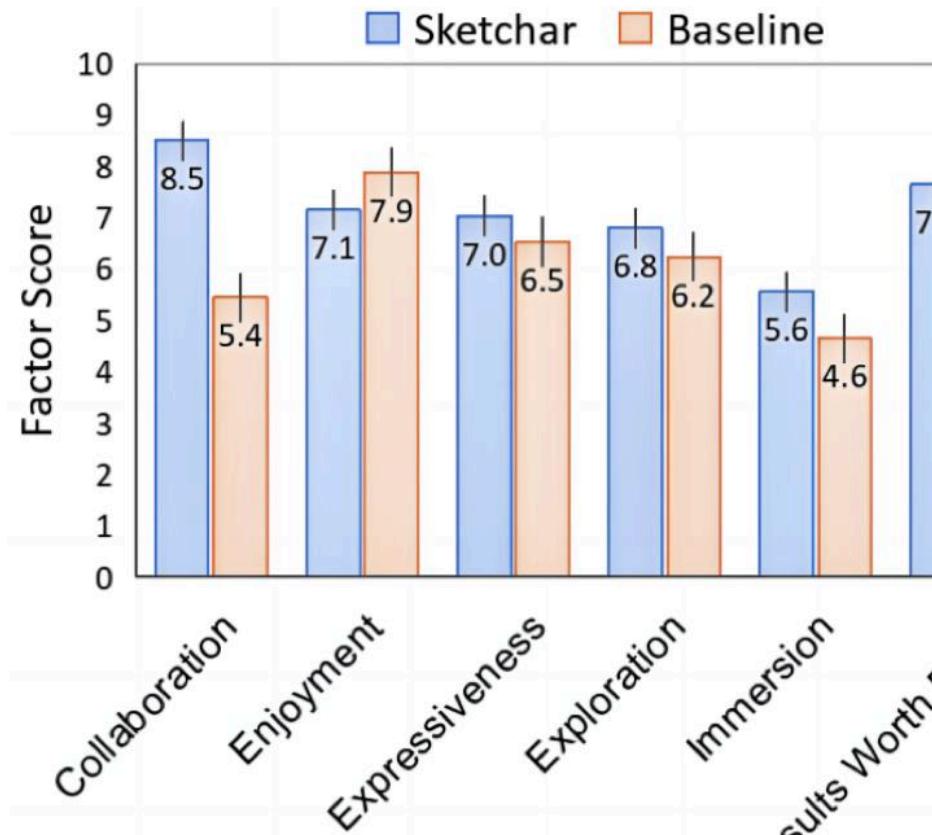


Quantitative Result

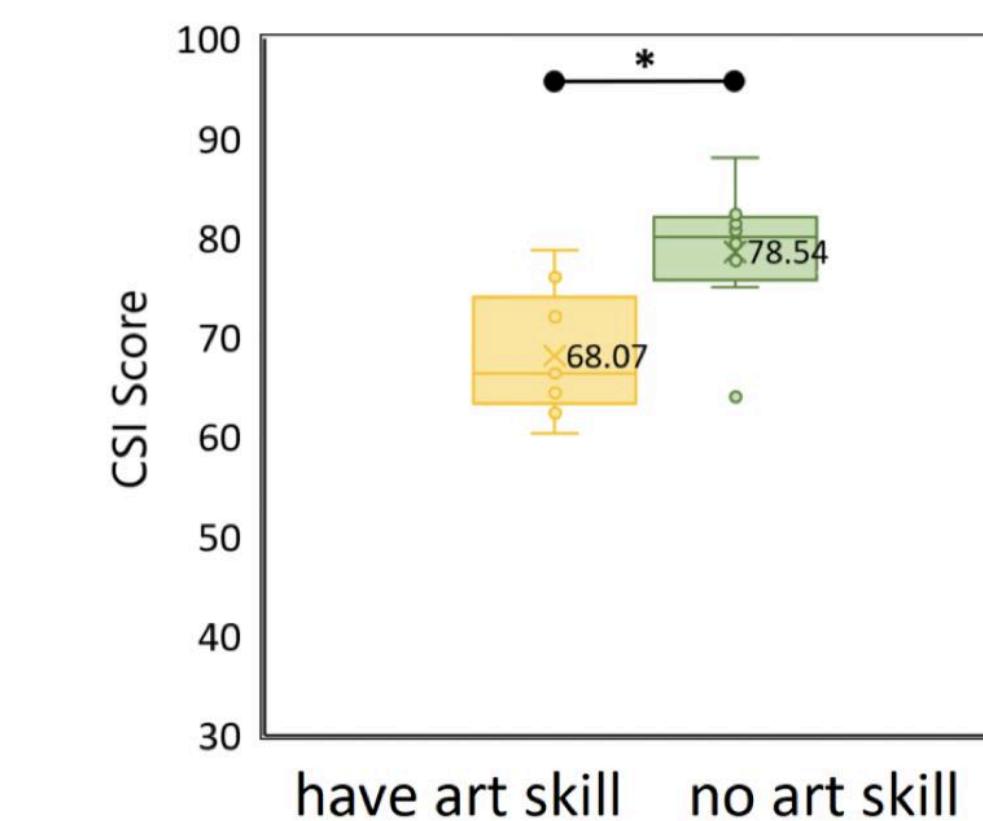
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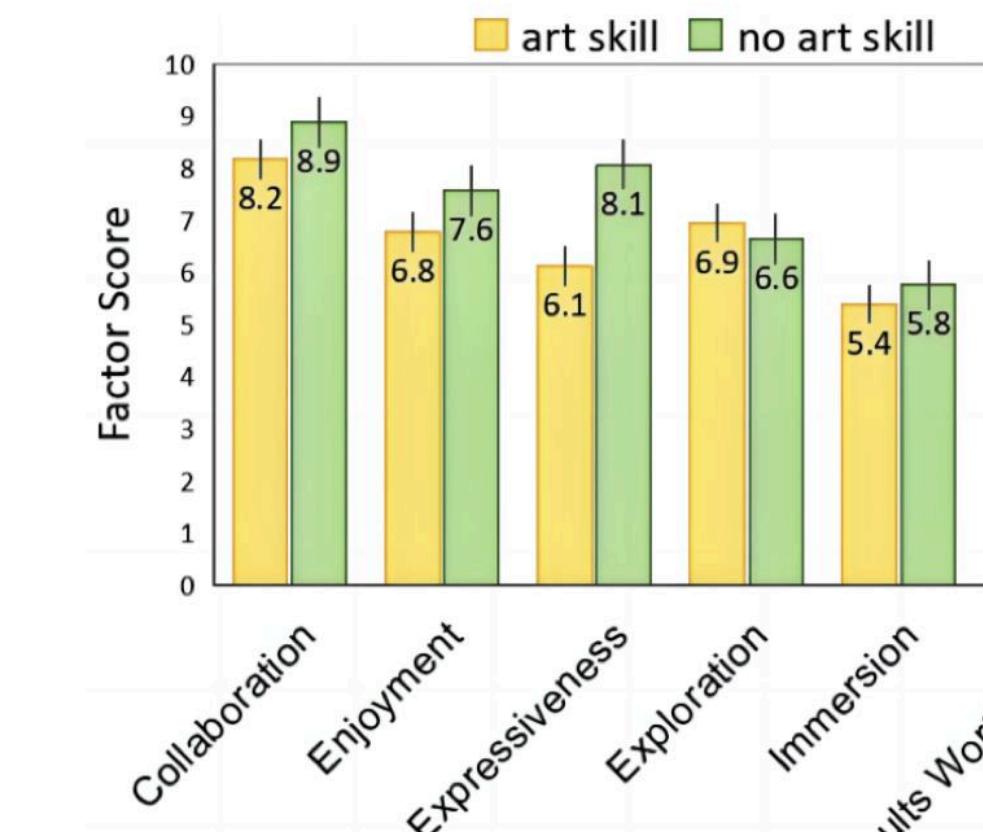
(a)



(c)



(b)



(d)

CSI Score

Results showed Sketchchar improved collaboration, especially for designers without artistic backgrounds.

Discussion

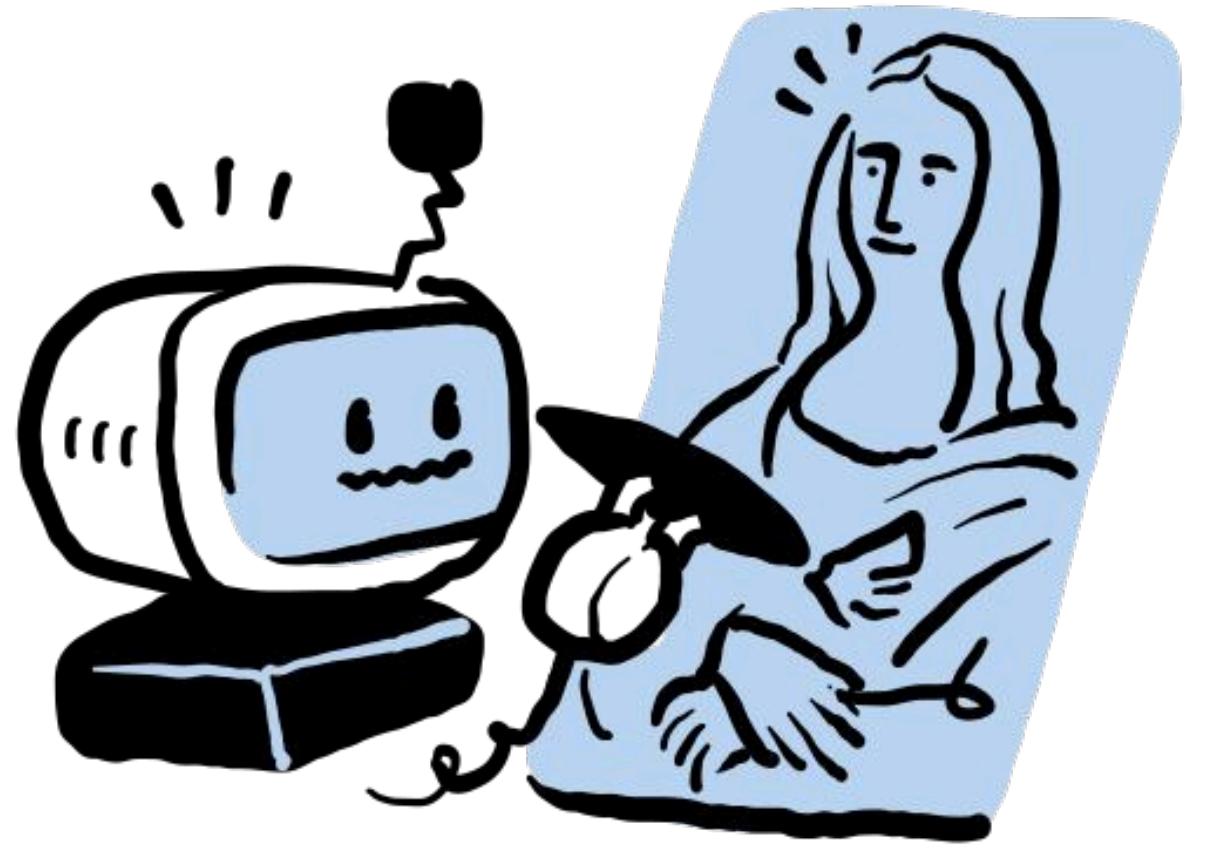
GenAI

A Support Tool for Expression and Inspiration

A Facilitator for Iterative Design and Illustration

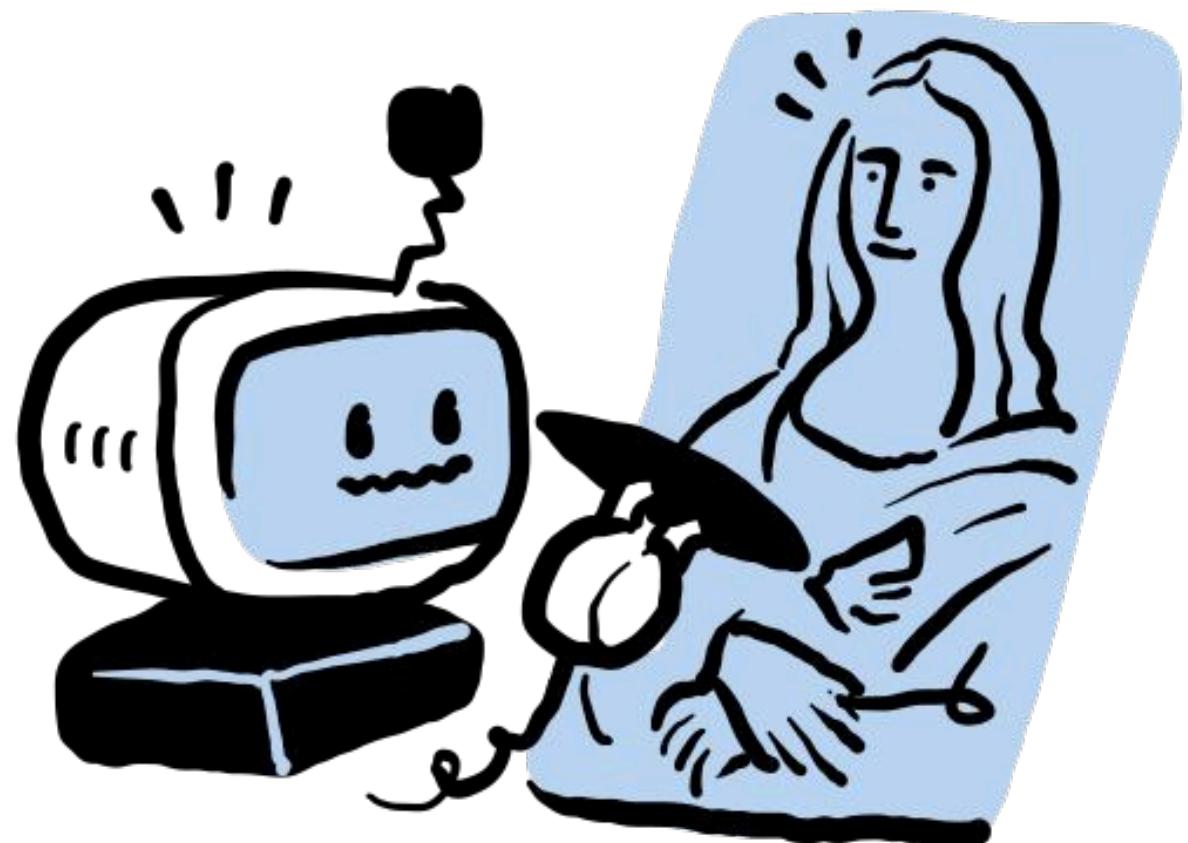
A Mediator for Effective Team Communication

limitation and Future Work

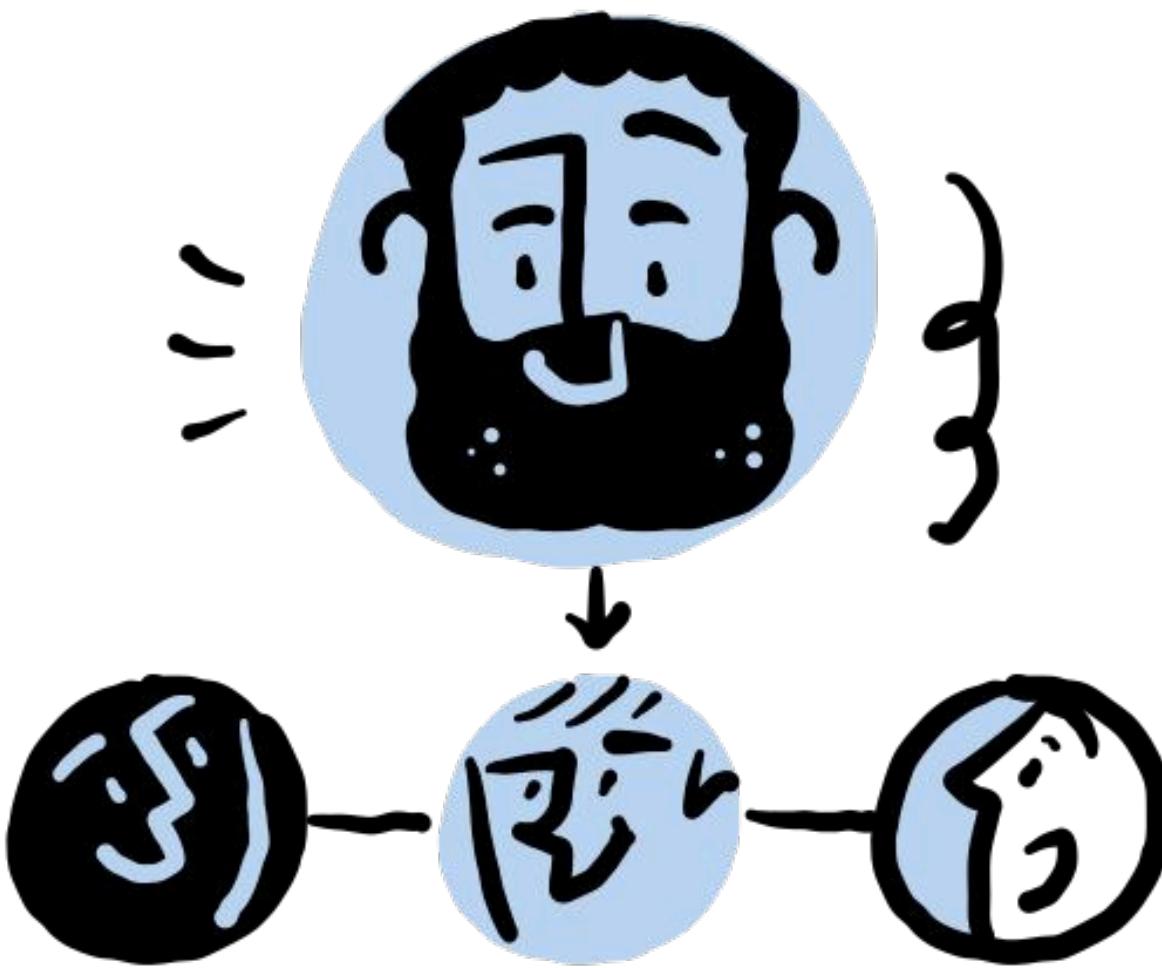


Improve the
quality of
generated image

limitation and Future Work

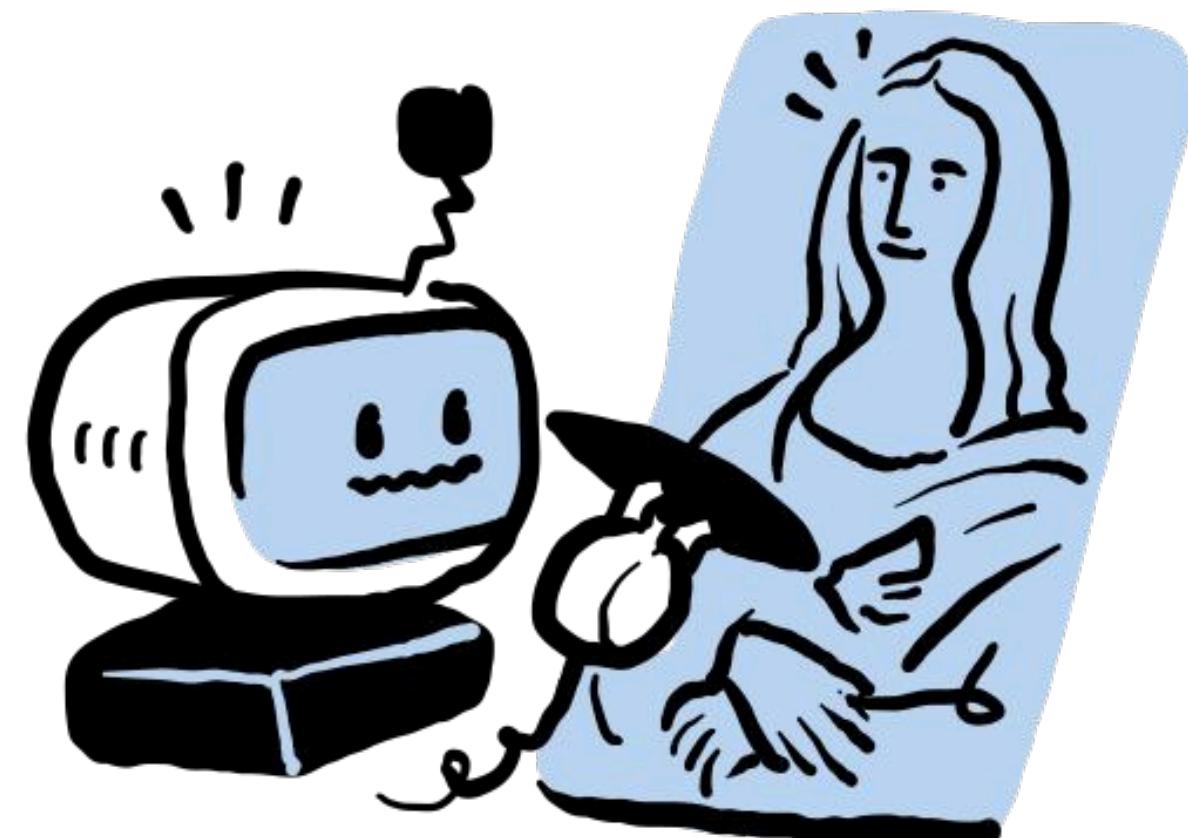


Improve the
quality of
generated image

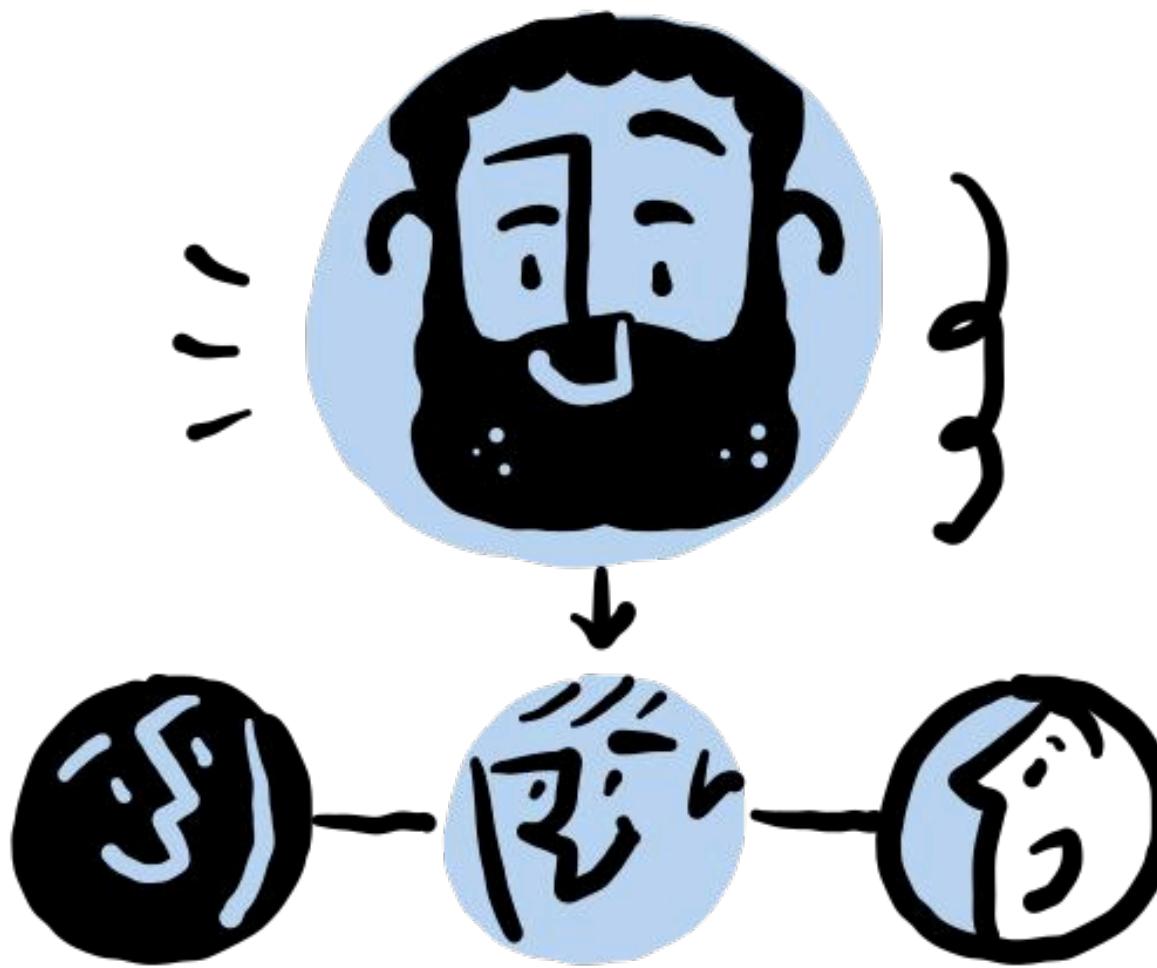


Achieve real-time
collaboration

limitation and Future Work



Improve the quality of generated image



Achieve real-time collaboration



Involve participants in different background

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Thanks for Watching

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